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FLEXPUB

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BELGIAN RESEARCH ACTION THROUGH INTERDISCIPLINARY NETWORKS

Work Package Report

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EXECUTIVE SUMMARY

FLEXPUB aims to contribute to the development of a federal strategy for enabling flexibility, adaptability and innovation in the public sector with a focus on a next generation of geospatial electronic services (e-services). It is expected that the public e-services will continuously change as citizens have higher expectations towards them and technological developments provide new possibilities. During the last two decades, the Belgian federal government and administration have taken significant steps to satisfy (tomorrow's) stakeholders, i.e. citizens, businesses and public organisations.

This Work Package (WP 4) dealt with the identification of enablers, which are factors that, individually and collectively, influence whether the requirements for e-service delivery identified in WP 3 can be achieved. This WP is the result of an ongoing research that started at the beginning of the FLEXPUB research project in 2016. The seven COBIT enablers are used as a means to assess the impacts of the changing requirements for the implementation of future public e-services. The results of WP 2 Baseline Measurement and WP 3 Requirements have strongly influenced the direction of this WP 4. On the basis of the needs and requirements collected from the respondents, the research team created an overview of potential enablers that can support the (federal) public administration in finding a way to deal with their needs and requirements.

In line with the previous reports, and research findings, it was decided to change the conceptual meaning of the enabler 5 "Information" to "Location-based data". Indeed, FLEXPUB is focused on the development of flexible and innovative geospatial e-services. The information can therefore be labelled in a more specific way as location-based data. For each of these enablers, the research team investigated what the requirements are to achieve both flexibility and innovation capability of the federal government. On the basis of a comprehensive cross-check of the enablers, possible policy options for enhanced flexible and innovative e-service delivery are listed and formulated. This final aspect makes also the connection to the WP 6 Strategy and WP 7 Blueprint. Indeed, the formulated policy options also come back in the Strategy and Blueprint.

In this report, a specific chapter is devoted to each of the seven COBIT enablers (Principles, Policies and Frameworks; Processes; Organisational Structures; Culture Ethics and Behaviour; Infrastructure; People, Skills and Competencies; and Location-based data), where the researchers have aimed to find possible approaches to deal with the identified needs and requirements. It has to be underlined that since the research is organised independently for each of the seven enablers, there is only a minor overarching research approach for this WP. The research for each of the enablers is based on in-depth interviews, a general questionnaire, a citizen questionnaire, focus groups, an international practice comparison, a literature review of (scientific) documents, a documents' analysis, or on a combination of those research methods. All those different approaches have contributed to the identification of good practices and possible solutions and/or contributions to deal with the identified needs and requirements.

Moreover, a number of cross-cutting policy options are included, and a connection is made to the Digital Belgium approach (2015-2020) which was launched under the impulse of Minister De Croo, and the Sustainable Development Goals (2015-2030) of the United Nations.

Finally, and besides identifying good practices, solutions and contributions, this WP also devotes attention to the various risks that could prevent the implementation of the suggested enablers. For each of these enablers, a number of risks are defined and discussed, as well as the likelihood of occurrence of those risks. Risk mitigation factors are proposed in order to suggest actions to circumvent the risks, or circumstances that reduce the risks' impact. Additionally, the consequences of the lack of implementation of the enablers are outlined in an impact assessment. In this way, the reader can immediately see what the effect of an enabler might be.

1. INTRODUCTION

This Work Package (WP 4) dealt with the identification of enablers, which are factors that, individually and collectively, influence whether the requirements for e-service delivery identified in WP 3 can be achieved. This WP is the result of an ongoing research that started at the beginning of the FLEXPUB research project in 2016. The seven COBIT enablers are used as a means to assess the impacts of the changing requirements for the implementation of future public e-services. The results of WP 2 Baseline Measurement and WP 3 Requirements have strongly influenced the direction of this WP 4. On the basis of the needs and requirements collected from the respondents, the research team created an overview of potential enablers that can support the (federal) public administration in finding a way to deal with their needs and requirements.

This holistic set of COBIT enablers is generic and useful for organisations of all sizes, and includes the following enablers:

- 1) Principles, policies and frameworks;
- 2) Processes;
- 3) Organisational structures;
- 4) Culture, ethics and behaviour;
- 5) Information;
- 6) Infrastructure (with associated architectures and standards); and
- 7) People, skills and competencies.

In line with the previous reports, and research findings, it was decided to change the conceptual meaning of the enabler 5 “Information” to “Location-based data”. Indeed, FLEXPUB is focused on the development of flexible and innovative geospatial e-services. The information can therefore be labelled in a more specific way as location-based data. For each of these enablers, the research team investigated what the requirements are to achieve both flexibility and innovation capability of the federal government. On the basis of a comprehensive cross-check of the enablers, possible policy options for enhanced flexible and innovative e-service delivery are listed and formulated. This final aspect makes also the connection to the WP 6 Strategy and WP 7 Blueprint. Indeed, the formulated policy options also come back in the Strategy and Blueprint.

This report is structured as follows. First, the methodology is further clarified. Second, each enabler is discussed. To do so, a brief overview of the identified needs and requirements is provided. This allows the reader to fully understand this Report independently from the WP 2 and WP 3 Reports. This information is followed by the suggested good practices and possible solutions and/or contributions. Third, the suggested policy options are integrated. This is an important interdisciplinary task as the outcomes of the previous tasks of this Work Package are cross-checked with each other in order to identify potential conflicts. Those policy options are also connected to the existing federal plans in a broad variety of policy areas. Fourth, this report includes an analysis of the existing risks as well as an impact assessment of the suggested policy options. Finally, a Conclusion follows. At the end of this Report a number of relevant Annexes can be found.

2. METHODOLOGY

This Work Package was executed on the basis of a multi-method approach, where the starting point was the outcome of WP2 Baseline Measurement and WP3 Requirements. Indeed, for each of the enablers, a number of needs and requirements were formulated in WP2 and WP3. In this WP4, we aim to find possible approaches to deal with the identified needs and requirements. It has to be underlined that since the research is organised independently for each of the seven enablers, there is only a minor overarching research approach for this WP. The research for each of the enablers is based on in-depth interviews, a general questionnaire, a citizen questionnaire, focus groups, an international practice comparison, a literature review of (scientific) documents, a documents' analysis, or on a combination of those research methods. All those different approaches have contributed to the identification of good practices and possible solutions and/or contributions to deal with the identified needs and requirements. Note that this WP has been an ongoing study throughout the entire duration of the research project (2016 – 2020).

Concerning the development of cross-cutting policy options, it was decided to structure those policy options on the basis of the feedback received from the Members of the Follow-up Committee. During bilateral meetings with the Members, they were asked to rank clusters of strategic actions that are presented in WP6 (Strategy – for the geospatial component). On the basis of this ranking exercise, a number of cross-cutting policy options have been developed for the policy options that are, according to the Members, the most important. By applying this approach, the researchers were able to identify and suggest cross-cutting policy options that are in line with the requirements of the Members of the Follow-up Committee.

The team also conducted an analysis of the risks that could prevent the implementation of the suggested enablers. To do so, the team decided to follow a similar methodological approach. For each of the identified enablers, a number of risks that could prevent the implementation of the enablers are discussed. The likelihood of occurrence for each of the risks is also included, as well as risk mitigation factors, which suggest actions to circumvent the risk, or circumstances that reduce the risk's impact. Finally, the consequences of the lack of implementation of the enablers are outlined, within this risk analysis, in an impact assessment. The identification of the risks, the likelihood of the risks, the mitigation factors and the consequences of the lack of implementation of the enablers is partially a theoretical exercise; is partially based on the input received from respondents via interviews (see also WP2) and focus groups (see also WP3); and is partially based on the international practice comparison; and is partially based on the bilateral meetings that were organised with the Members of the Follow-up Committee in order to discuss the updated version of the Strategy.

Whereas this WP is strongly connected to WP2 and WP3, there is less of a connection to WP5 Case studies. There is, however, also a strong connection to WP6 Strategy and WP7 Blueprint as the suggested actions in those WPs are also based on the findings in this WP. This interdisciplinary analysis integrated different views (Law; Business engineering; Public administration; Geo-spatial knowledge) and matches the seven COBIT enabler used for WP 2 and 3. It should, however, be underlined that each team member worked on a number of specific enablers. Therefore, the focus of this research was more specific and individualised. Nevertheless, the identified good practices and possible solutions and/or contributions to deal with the identified needs and requirements have been cross-checked by all team members. An overview of the methodological approach that was followed for each of the different enablers can be found below.

PRINCIPLES, POLICIES AND FRAMEWORKS

The research for the Enabler "Principles, policies and frameworks" was conducted on the basis of the questionnaires prepared for WP 2, and of the in-depth interviews led in the context of WP 3. This was then complimented by an international practice comparison, a non-systematic literature review of (scientific) documents and an analysis of the relevant legislation.

Among the two requirements identified in WP3, it was decided to focus more deeply on "Open Data", as the team's expertise was the strongest for this requirement and this is where it could be the most influential. However, some

enablers are also provided regarding the “Personal data protection” requirement. Moreover, the use of digital-ready legislation as an enabler for efficient public service delivery (Danish initiative) is also presented.

The specific enablers for Open Data, on which we focus in Chapter 3 below, have been identified thanks to two focus groups. The first one gathered six participants and was held at the National Geographic Institute in Brussels in the beginning of November 2017. The participants came from the Federal administration, the Flemish Region, the Brussels Region and the city of Brussels. The second focus group was organised at the end of November 2017. It gathered five people attending this meeting, including civil servants from the European and Federal level, as well as a representative of the private sector.

Finally, some additional insights have been gathered during a workshop organised by the team on the 26th of September 2019 (*“Revision of the PSI & Open Data Directive – What impact for your administration?”*), which gathered around 50 civil servants from the Federal and Regional levels. Tools to raise awareness about the benefits of Open Data were notably discussed during this workshop.

PROCESSES

In order to identify the 8 participation methods, we first performed a literature review of current literature in well-regarded scientific electronic databases (Google Scholar, Scopus, ScienceDirect, Web of Science) (Falagas et al., 2008). In order to be considered for reviewing, the articles had to include at least one of the following terms in their title and/or abstract: “co-creation”, “software development”, “e-government”, “user”, “citizen” or “participation”. This review allowed us to identify 19 papers¹ discussing these eight participation methods. Then, we evaluated the relevance and use of these methods in practice by means of in-depth interviews and two questionnaires (one targeting public servants and one targeting citizens). Since the interviews and the public servants’ questionnaire were conducted in the federal country of Belgium, it was necessary that the target group had a balance between different governmental levels in order to reach a representative sample.

Then, in order to validate these methods, we have chosen to apply the Action Research methodology, that can be defined as “an approach in which the action researcher and a client collaborate in the diagnosis of the problem and in the development of a solution based on the diagnosis” (Bryman & Bell, 2007). We believe this approach is appropriate as it implies a close collaboration between the researchers and the members of the organisation where the research takes place. In this case, we applied this methodology to the case of La Louvière that wanted to engage in an e-government strategy and the development of an e-government portal to offer its service online.

These insights were complemented by the interviews in WP3 and the questionnaires in WP2.

ORGANISATIONAL STRUCTURES

A combination of various methodological approaches was used to identify good practices and possible solutions and/or contributions to deal with the identified needs and requirements. The following methodological steps have been followed to deliver the results, whereby the starting point lies at the beginning of the research project (2016). In the first step, a non-systematic literature review was conducted to collect relevant insight on the organisational structure of a public administration. This information was then used in the second step, which included three research activities: the general questionnaire, the interviews and the focus groups. The data collected via those three research activities has not only served WP2 and WP3, but also this WP. Indeed, various respondents indicated potential relevant good practices and/or potential solutions. Afterwards, a third step was taken, whereby a review of international best practices took place. Once more this research activity served not only this WP, but also WP3. A final and fourth step, was a combined literature review and documents’ analysis. The literature review focused on connecting the insights of previous data collection activities with the theoretical insights from the scientific community. The documents’ analysis aimed to increase the understanding of the organisational structures of the Belgian federal administration regarding geospatial e-services.

¹ The full list of papers is not included in this Chapter due to space constraints.

CULTURE, ETHICS AND BEHAVIOUR

As the research for this enabler was executed by the same researcher as the research for the enabler “Organisational structures”, a similar methodology was applied. The research approach is a combination of various methodological approaches which allowed to identify good practices and possible solutions and/or contributions to deal with the identified needs and requirements. The following methodological steps have been followed to deliver the results, whereby the starting point lies at the beginning of the research project (2016). In the first step, a non-systematic literature review was conducted to collect relevant insight on the culture, ethics and behaviour in a public administration – what does it mean, what does it entail and how can possible good practices and solutions look like? This information was then used in the second step, which included three research activities: the general questionnaire, the interviews and the focus groups. The data collected via those three research activities has not only served WP2 and WP3, but also this WP. Indeed, various respondents indicated potential relevant good practices and/or potential solutions. Afterwards, a third step was taken, whereby a review of international best practices took place. Once more, this research activity served not only this WP, but also WP3. A final, and fourth step, was a combined literature review and documents’ analysis. The literature review focused on connecting the insights of previous data collection activities with the theoretical insights from the scientific community. The documents’ analysis aimed to increase the understanding of the organisational structures of the Belgian federal administration concerning geospatial e-services.

INFRASTRUCTURE

In order to study the ICT infrastructure in an e-government context, we analysed papers from different scientific sources such as ScienceDirect, Elsevier, and Google Scholar. First, we investigated documentation about E-Government in order to find the main keywords associated with it. From there, we looked into “Cloud Computing” and “Service Oriented Architecture” that seemed to be the technologies at stake while talking about E-Government. Then, we went deeper into those technologies with terms such as “Microservices”. Finally, we investigated documentation about “E-Government 2.0” and its inspiration the “web 2.0”.

After the literature review, we gathered information from online sources such as “Belgium.be” and “dt.bosa.be”. Furthermore, we performed interviews with the Federal Public Service (FPS) BOSA. Finally, we did an international comparison with a leading country from the EU and one from the UN respectively Estonia and the Republic of Korea (Sun et al., 2015). This comparison aimed to find best practice examples and ideas from leading countries in the matter of E-Government. The comparison axes are based on the literature review.

PEOPLE, SKILLS AND COMPETENCES

The research for the Enabler “People, skills and competencies” was conducted on the basis of the questionnaires prepared for WP 2, and of the in-depth interviews led in the context of WP 3. This was then complimented by an international practice comparison, a non-systematic literature review of (scientific) documents, and a documents’ analysis (for example the European Commission’s Annual eGovernment Benchmarking Reports).

Among the three requirements identified in WP3, it was decided to focus more deeply on the “Public sector attractiveness”, as the team’s expertise was the strongest for this requirement and this is where it could be the most influential. However, some enablers are also provided regarding the “Digital divide” requirement. As the team does not have any impact on the budgetary choices of the governments, no enabler can be suggested for the last requirement “Lack of financial resources”.

For “Public sector attractiveness”, a series of enablers for attracting and retaining IT profiles are presented in Chapter 8 below. These enablers have been identified thanks to a focus group organised with civil servants, specialised in HR, of the Federal and Walloon administration. It gathered four participants and it was held in Namur in mid-December 2017. This allowed to show that both entities were facing the same issues.

LOCATION-BASED DATA

A combination of various methodological approaches was used to identify good practices and possible solutions and/or contributions to deal with the identified needs and requirements. The research for this enabler was conducted on the basis of the questionnaires prepared for WP 2, and of the in-depth interviews led in the context of WP 3. This was then complimented by an international practice comparison, a non-systematic literature review of (scientific) documents, and a documents' analysis focused on grey literature.

3. PRINCIPLES, POLICIES AND FRAMEWORKS

REQUIREMENTS

OPEN DATA POLICIES

It results from the interviews (see WP 3 report) that the issue regarding Open Data is not so much the administrations' unwillingness to share data, but rather the lack of financial means to do so. The financial implications of the implementation of a sound and comprehensive Open Data environment are indeed non-negligible. There is thus a need for a sustainable funding in order to ensure the quality, the continuity and the maintenance of this data once it has been opened, which is often under-estimated by the political actors.

Moreover, it also resulted from the interviews that the administrations are often demotivated about implementing "Open data policies", as they only see the costs of open data, and not its benefits. Thus, there is still a clear need to raise the civil servants' awareness about the benefits of Open Data, in order for them to better embrace the "Open Data mentality".

Finally, as each level of power is free to determine the licensing conditions that it applies to its Open Data licences – provided that these conditions respect the obligations and interdictions of the PSI Directive² –, there is a risk that these licensing conditions might be incompatible. Accordingly, in order to avoid the issues of incompatibility of "date re-use licences", harmonisation of the licences of the various entities (Federal, Regions...) should be achieved.

PERSONAL DATA PROTECTION

It is no secret that the administrations process a large number of citizen's personal data. Yet, these administrations are not allowed to do whatever they want with this personal data, as they have to comply with the rules on personal data processing which are contained in the European General Data Protection Regulation³ (hereafter "GDPR"), repealing and replacing Directive 95/46, that was adopted on the 27th of April 2016 and is applicable since the 25th of May 2018. The adoption of the Regulation presents several challenges for the administrations as it is directly applicable to them and they might thus have to revise their former way of processing personal data in order to be compliant with this new regulation. Indeed, the principles of accountability and of privacy by design and by default, which are at the core of this new European Regulation, were not explicit in the former Directive and in the Belgian Law of 1992⁴. In Belgium, the GDPR was complemented by a Law of 3 December 2017 creating the Data Protection Authority⁵ and a Law of 30 July 2018 pertaining to the protection of natural persons regarding the processing of personal data⁶.

RESEARCH QUESTIONS

In establishing these enablers, the researchers have been guided by the following main research question and sub-question: *How to tackle the regulatory challenges faced by the administrations in developing public e-services?*

- How did the PSI and INSPIRE Directives impact the Open Data policies within the administrations?
- What are the remaining barriers to an effective Open Data environment?

² Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information, *OJ L 175/1*, 27 June 2013; Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, *OJ L 172/56*, 26 June 2019.

³ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), *OJ L 119*, 4 May 2016.

⁴ Loi du 8 décembre 1992 relative à la protection de la vie privée à l'égard des traitements de données à caractère personnel, *M.B.*, 18 mars 1993.

⁵ Loi du 3 décembre 2017 portant création de l'Autorité de protection des données, *M.B.*, 10 janvier 2018.

⁶ Loi du 30 juillet 2018 relative à la protection des personnes physiques à l'égard des traitements de données à caractère personnel, *M.B.*, 5 septembre 2018.

- What suggestions for adaptations could be made?
- Which Open Data licence model should be used by the administrations?
- What should the administrations do to be GDPR ready and compliant?

ENABLERS

Among the two requirements identified in WP3, it was decided to focus more deeply on “Open Data”, as the team’s expertise was the strongest for this requirement and this is where it could be the most influential. However, some enablers are also provided regarding the “Personal data protection” requirement. Moreover, the use of digital-ready legislation as an enabler for efficient public service delivery (Danish initiative) is also presented.

OPEN DATA

The enablers presented here have been identified thanks to two focus groups. The first one gathered six participants and was held at the National Geographic Institute in Brussels in the beginning of November 2017. The participants came from the Federal administration, the Flemish Region, the Brussels Region and the city of Brussels. The second focus group was organised at the end of November 2017. It gathered five people attending this meeting, including civil servants from the European and Federal level, as well as a representative of the private sector.

Moreover, some additional insights have been gathered during a workshop organised by the team on the 26th of September 2019 (*“Revision of the PSI & Open Data Directive – What impact for your administration?”*), which gathered around 50 civil servants from the Federal and Regional levels. Tools to raise awareness about the benefits of Open Data were notably discussed during this workshop.

SUSTAINABLE FUNDING

Administrations need to foresee sustainable “Open Data funding” in order to ensure the quality, the continuity and the maintenance of the opened data, which should ideally not only be raw data, but also value-added data. Indeed, opening data is not solely about uploading data on a portal once and for all and leaving it there. It is about ensuring the continuous update and quality of the data, so that the re-users get access to valuable data. Indeed, the value of the data for re-users is function of its nature (value-added data is more useful than raw data), quality and up-to-dateness, and the administrations should strive towards meeting these requirements. In this regard, it should be pointed out that in June 2019, the EU adopted a recast version of the PSI Directive⁷, that will have to be transposed in all Member States by July 2021, and that this new legal text provides that public sector bodies shall make dynamic data⁸ available for re-use immediately after collection, via suitable application programming interfaces (APIs).

This sustainable funding could be done in two different ways, namely via a global budgetary envelope, which would cover the costs of all the open data policies of the administration, or via the creation of “Freemium models”. Under this second model, public data is shared freely, but the administration could sell services built on top of this data to third parties. Under the first model, the costs of Open Data for all the Federal administrations are aggregated under one single budget heading financed directly by the government, instead of being spread across the different administrations, that each have to allocate some of their own budget to Open Data. According to a civil servant working for the Chancery of the Prime Minister, this global envelope model is the desired way to go, as the aggregated costs of Open Data are in fact quite reasonable compared to the expected benefits.

Interestingly, the review of the PSI Directive that occurred in 2019 at the European level might stimulate the creation of such a global budgetary envelope. This is because it creates a new category of public data, namely “high-value

⁷ Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, OJ L 172/56, 26 June 2019.

⁸ “Documents in a digital form, subject to frequent or real-time updates, in particular because of their volatility or rapid obsolescence; data generated by sensors are typically considered to be dynamic data” (Article 2.8 of the Directive 2019/1024).

datasets”⁹ held by public sector bodies and public undertakings – the list of which will have to be laid down in an implementing act by the European Commission –, that will have to be shared for free¹⁰. Though this precise list has not been defined yet, Annex 1 of the 2019 PSI Directive already contains a list of thematic categories of high-value datasets, namely geospatial, earth observation and environment, meteorological, statistics, companies and mobility data. From this list, it seems obvious that a large number of datasets held by the administrations could be considered as having a “high-value” and will have to be shared for free.

This will have a major impact on some administrations that have to finance themselves (as their functioning is not 100% financed by tax collection), such as the NGI. Indeed, under the regime of the 2013 PSI Directive¹¹, the administrations who were required to generate sufficient revenue to cover a substantial part of the costs relating to their collection, production, reproduction and dissemination of data, could claim not only the marginal costs incurred for the reproduction, provision and dissemination of the data, but also a reasonable return on investment for the sharing¹². However, this will change in the regime of the 2019 PSI Directive, as they will no longer benefit from this preferential regime for their datasets considered as being of “high-value”, which they will have to share for free no matter what¹³. The Directive adds that if this would lead to a substantial impact on the budget of the administrations involved, Member States may exempt those administrations from the requirement to make those high-value datasets available free of charge for a period of no more than two years following the entry into force of the transposition act¹⁴. Said otherwise, Belgium could delay this requirement until July 2023 instead of having it start in July 2021.

Yet, this modification is inevitable, and in light of the impact that it might have on the budget of some administrations, this European requirement could be the ideal justification to change the current way of financing Open Data at the Federal level, by stimulating the creation of a global budgetary envelope that would cover the loss of budget incurred by this new European requirement.

This should thus actively be discussed in the coming years, as it is a unique chance for the Belgian government to adapt.

RAISING AWARENESS ABOUT THE BENEFITS OF OPEN DATA

Transitioning towards a truly “Open Data mentality” implies more than simply uploading data on platforms. It requires a fundamental reflection on data governance, as rethinking the whole information management system is a pre-requisite to achieve efficient and effective openness. While this process has been started by the administration, it is a constant work in progress to reflect on how the information infrastructure should serve the administration’s goals. Accordingly, opening up public information is a major change requiring a great deal of time and resources. To motivate the administration to engage in such a revolution, it needs to be guided and convinced that this will not only be useful for the re-users, i.e. private sector, NGOs, citizens etc., but that it is most importantly beneficial for itself. Indeed, the public sector is the first beneficiary of Open Data because it forces the administration to invest in its information management systems and in structures that will facilitate its work, and it also allows to break silos within the administration as the various departments are thereby made aware of the informational resources that already exists internally elsewhere.

A key enabler for the good roll out of Open Data policies is thus to launch awareness-raising campaigns about the benefits of Open Data in the administration. Indeed, if the civil servants saw the benefits of their work on Open

⁹ “Documents the re-use of which is associated with important benefits for society, the environment and the economy, in particular because of their suitability for the creation of value-added services, applications and new, high-quality and decent jobs, and of the number of potential beneficiaries of the value-added services and applications based on those datasets” (Article 2.10 of the Directive 2019/1024).

¹⁰ Arts. 6.6.a) and 14.1 of the Directive 2019/1024.

¹¹ Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information, *OJ L 175/1*, 27 June 2013.

¹² Art. 6.2.b) and c) of the Directive 2013/37.

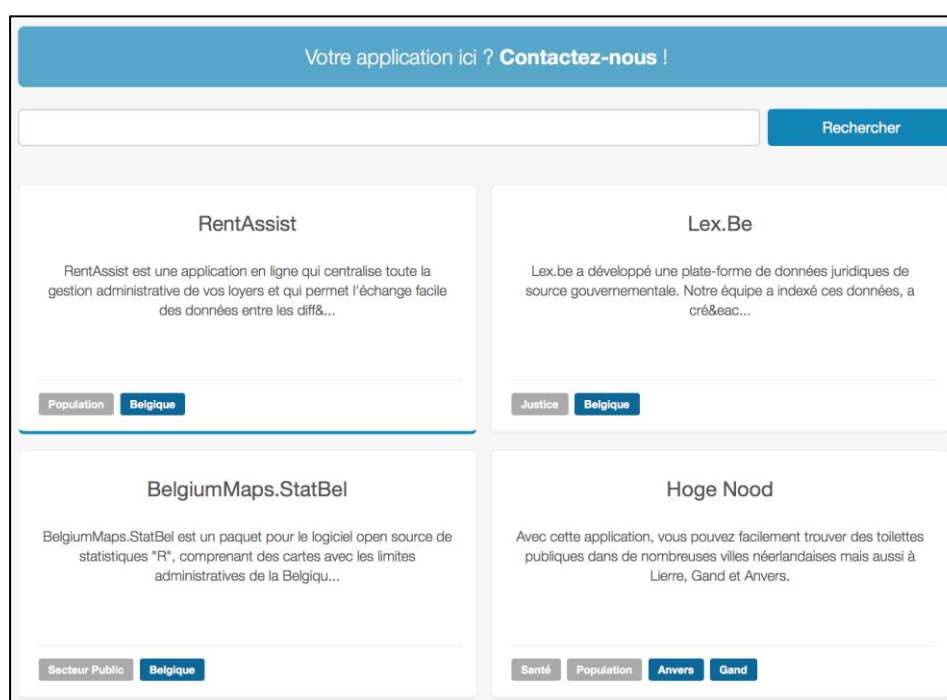
¹³ Art. 14.5 of the Directive 2019/1024.

¹⁴ Art. 14.5 of the Directive 2019/1024.

Data, and not just the time and money spent on it, they would be more motivated and this would increase adherence, by the administrations, to the “Open Data mentality”.

One way to enable this awareness raising is to facilitate the administrations’ ability to track the data re-use – e.g. via API (Application Programming Interface) logs or attribution clauses in licences. Such clause implies that the re-user has to indicate the source of the data he has acquired, and is commonly used in the Creative Commons Licences.¹⁵ Indeed, shining some light on “Re-use success stories” would allow the administrations to give positive feedback not only to their civil servants (which would enhance their motivation to keep working on Open Data policies), but also to the political deciders (notably in order to justify the switch to a global budgetary envelope model). This could also be done by asking re-users to indicate links to their re-use applications in a specific section on the Open Data portal. This is for example done on the Federal Open Data portal – see Figure 1 (Federale Overheid, n.d.).

Figure 1: Federal Open Data Portal - Example



Source: Federale Overheid (n.d.)

In order to stimulate this feedback loop mentioned above, another enabler would be to offer “Re-use awards” every year to the best “Re-use success stories” that have been reported on the platform. Indeed, this would incentivise re-users to inform the administrations about their re-uses, and this would provide more visibility to the administrations on what is done with the opened data.

Another enabler would be to collaborate with the academic sector. For example, Master students in computer science, mathematics and business of the University of Namur were asked, in the context of a class, to create an App on the basis of the Open Data from the city of Namur, Paris or London. These projects were then presented to the Open Data managers of the city of Namur, and allowed them to see what can be concretely done with the Open Data of the city. They could then relay this in their administration, in order to show the benefits of Open Data and to get support in order to improve the quality of the data and the portal. Similar comparable initiatives, such as hackathons, could also be organised (see for example Hack4gov.be, Open Summer of Gov, Citizens of Wallonia Hackathon, Hope for Climate Hackathon...).

Another enabler is to create more user-friendly open data portals. Indeed, by making them more usable, this

¹⁵ More information on the CC-BY Licence can be found at <https://creativecommons.org/licenses/by/4.0/>.

stimulates their use by non-experts. In turn, this motivates the civil servants as they realise that Open Data doesn't only benefit tech-savvy people, but also the common citizen. In this regard, the administrations should provide tools and instruments facilitating the re-use. The goal is to make sure that Open Data policies benefit to all and not only to private companies. One way to do so would be to create a single point of contact to help re-users know where to find the specific information that they look for (which administrations produces it, where can they access it, etc.). There is also a need for standardisation, in order to facilitate the re-use of multiple datasets coming from different administrations.

Moreover, administrations need to collaborate with their re-users, in order to ensure that the public sector data is always of the utmost quality and timeliness. Indeed, while the administrations use data for their own functioning, they might not always need this data to be of a perfect quality or perfectly up-to-date to be able to provide their public services. Thus, they might not have the incentive to "go the extra-mile" to increase the quality and up-to-dateness for the re-users that require it for their own services. One enabler to solve this issue would be to create an ecosystem where public-private-partnerships (PPPs) are entered into in order for re-users to increase this quality and up-to-dateness of public data not only for their own benefit, but also for the benefit of the administrations (e.g. the FPS Mobility could enter into a partnership with applications such as Waze in order to get real-time data about the status of traffic jams in order to re-orient drivers, via interactive screens on the road). This would, once again, allow the administration to see the added-value of Open Data initiatives.

HARMONISATION OF THE RE-USE LICENCES

Finally, in order to enable re-users to combine data held by administrations of different levels of power, the administrations should strive towards harmonising the various "data re-use licences", in order to avoid licensing incompatibilities' issue. This not only requires ensuring technical standards' compatibility between the various licences, but also legal compatibility. Moreover, these licences need to be available for all on the Open data platforms, in order for the platforms' visitors to know what their rights and obligations will be if they decide to re-use the data.

Accordingly, one enabler would be to develop a common licence (for all the levels of power) which would replace the current licence fragmentation. As the FLEXPUB project focusses on location-based data, the large majority of which fall under the scope of the INSPIRE Directive¹⁶, the team recommends that this discussion should occur within the Belgian INSPIRE Committee. In any case, the standard for such licence should be based on European standards, namely the CC-BY or the CC0 Creative Commons licence (Creative Commons, n.d.-a, n.d.-b) .

PERSONAL DATA PROTECTION

A key enabler for a flexible and innovative government is taking personal data protection and security concerns into consideration from the start when designing public e-services (privacy-by-design)¹⁷ and implementing appropriate technical and organisational measures for ensuring that, by default, only personal data which are necessary for each specific purpose of the processing are processed (privacy by-default)¹⁸.

¹⁶ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), *OJ L 108*, 25 April 2007.

¹⁷ Art. 25.1 of the GDPR.

¹⁸ Art. 25.2 of the GDPR.

In this regard, processings¹⁹ of personal data²⁰ by the administrations must rely on a lawful basis of processing²¹ and the administrations should inform the data subjects²² about these processings in a fair and transparent manner²³. These processings should comply with the purpose limitation principle, according to which they should be limited to specified, explicit and legitimate purposes²⁴. These processings should also be limited to the data that is adequate, relevant and necessary for these specific purposes²⁵, and the accuracy and up-to-dateness of the data should be ensured²⁶. Additionally, the personal data should be kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed²⁷, and appropriate technical or organisational measures should be set in place in order to ensure the security of the personal data that is processed²⁸. The administrations will have to document how their processings of personal data comply with these principles (“*accountability*”)²⁹ and they will also have to ensure that the data subjects can exercise their rights in a timely and cost-free fashion³⁰.

Moreover, the administrations will have to appoint a “Data protection officer” (hereafter DPO)³¹, who will have a fundamental role to play in educating the civil servants about the GDPR (workshops, traineeships...) and in setting in place the rules and processes to be applied in order to be GDPR compliant. It is important to point out here that the administrations can share a common DPO. This especially makes sense for smaller administrations, for example local communities, who have very limited means, yet execute essentially the same missions, which would allow some economies of scale. However, for larger administrations such as FPSs, it is strongly advised to have one DPO per administration.

USE OF DIGITAL-READY LEGISLATION

The law is often depicted as being late to react to digital evolutions. Though this is true to some extent, this is also justified by the fact that the adoption of a law requires to respect a well-established democratic process, filled with checks and balances, that are necessary in order to ensure that the values of the State are respected in the legislation. Accordingly, the laws are generally formulated in an open way, in order to cover future technological developments and in order to avoid becoming outdated too quickly.

Yet, the legislator rarely incorporates digitisation and technical implementation in the preparation of the legislation, while this is highly beneficial in order to create innovative and flexible e-services. Accordingly, taking inspiration from what is done abroad in this regard could enable such a positive evolution.

¹⁹ “Processing” means “any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction” (Art. 4.2 of the GDPR).

²⁰ “Personal data” means “any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person” (Art. 4.1 of the GDPR).

²¹ Art. 6 of the GDPR identifies six lawful bases for the processing of personal data, namely: (a) consent; (b) necessary processing for the performance of a contract; (c) necessary processing for compliance with a legal obligation; (d) necessary processing in order to protect the vital interests of the data subject or of another natural person; (e) necessary processing for the performance of a task carried out in the public interest or in the exercise of official authority; and (f) necessary processing for the purposes of the legitimate interests pursued by the controller or by a third party, except where such interests are overridden by the interests or fundamental rights and freedoms of the data subject which require protection of personal data.

²² “Data subject” means “any identified or identifiable natural person” (Art. 4.1 of the GDPR).

²³ Arts. 5.1.a) and 12 to 14 of the GDPR.

²⁴ Art. 5.1.b) of the GDPR.

²⁵ Art. 5.1.c) of the GDPR.

²⁶ Art. 5.1.d) of the GDPR.

²⁷ Art. 5.1.e) of the GDPR.

²⁸ Art. 5.1.f) of the GDPR

²⁹ Art. 5.2 of the GDPR

³⁰ Arts. 12 and 15 to 22 of the GDPR.

³¹ Art. 37.1.a) of the GDPR.

More precisely, Belgium could enable more innovative and flexible e-services by replicating Denmark's initiative pertaining to "Digital-ready legislation". The goal of this initiative is to "*ensure a simpler, clearer legal framework which is easy to understand and translate into secure and user-friendly digital solutions. [It] describes the new requirements to be fulfilled by the ministries in connection with the preparation of new legislation in order to support digital-ready legislation*" (Danish Ministry of Finance - Agency for Digitalisation, n.d., 2018). Such digital-ready legislation should create the basis for more up-to-dateness and contribute to a more user-friendly, easily accessible and transparent public sector, in order to ensure a more modern and effective public service (Danish Ministry of Finance - Agency for Digitalisation, 2018).

In essence, the Danish government has reached a political agreement according to which any new legislation must be digital-by-default and according to which the relevant ministry is compelled to assess and describe, for each law proposal, the technical and public implementation impacts of the law in an explanatory note (Danish Ministry of Finance - Agency for Digitalisation, 2018).

These public implementation impacts imply verifying:

- The compliance with the seven principles for digital-ready legislation (Danish Ministry of Finance - Agency for Digitalisation, 2018). Namely, any new legislation must:
 - i. Be simple and clear so that it is easy to understand for citizens as well as businesses (pp. 8-9);
 - ii. Support digital communication with citizens and businesses (pp. 9-10));
 - iii. Support complete or partial digital administration of the legislation with due consideration for the legal rights of citizens and businesses (pp.11-13);
 - iv. Rely on uniform concepts and means for data re-use, by looking at what already exists in other legislations, in order to create coherence and consistency across the public sector and to support an effective public service (pp. 13-14);
 - v. Provide for a high degree of data security (pp. 14-15);
 - vi. Use, to the extent possible, existing public infrastructure to ensure the largest degree of reuse and cohesion across authorities (p. 15); and
 - vii. Consider, already during the preparation of the legislation, the possibility of subsequent control and prevention of fraud and errors (pp. 15-16);
- The compliance with data protection and data re-use considerations (p. 19);
- The organisational conditions and administrative transitional and operating impacts (pp. 16-17); and
- The IT support and management requirements as well as the risks (pp. 17-18).

In terms of procedure, the Guidance provides that law proposals "*which, in the assessment of the specific ministry, involve implementation impacts, (...) should be submitted for consultation with the **Secretariat for digital-ready legislation under the Danish Agency for Digitisation**, preferably 6 weeks before public consultation*" (Danish Ministry of Finance - Agency for Digitalisation, 2018) (emphasis added). The Secretariat then reviews the draft law proposals in order to assess the implementation impacts of the law proposals, and issues a consultation letter that may include recommendations on the preparation of the law text. Moreover, it should also be pointed out that the Secretariat receives every year, before the summer holidays, the legislative programme for the year to come, which allows it to do a first screening of the future law proposals for which it will be particularly relevant to initiate an early dialogue with the specific ministry on digital-ready legislation (Danish Ministry of Finance - Agency for Digitalisation, 2018). This good practice stemming from Denmark could be replicated in Belgium and such a "Secretariat for digital-ready legislation" could, for instance, be created within the DG Digital Transformation of the FPS BOSA.

4. PROCESSES

REQUIREMENTS

In WP3, different requirements related to the process of developing flexible and innovative e-services were identified. The requirements were stated as follows:

- **User Participation:** Difficulty to mobilise users so that they participate actively in the development of the e-service
- **Lack of Internal Competences:** Unavailability of specific profiles in e-service development teams (IT, Business Analysts, Agile specialist, etc.).
- **Business Unavailability:** Siloed structure impeding the internal alignment between business experts and IT stakeholders.
- **Lack of Management Support:** Lack of support from high-level, mid-level and operational employees as well as from political representatives to support the change in development practices.
- **Impact of Regulations:** Impact of regulatory compliance and political agendas on development practices.
- **Hierarchical Structure:** Presence of a hierarchical decision-making process.
- **Poor Innovation Management:** Lack of innovation due to budget constraints.
- **Domain Complexity:** Complexity of the project in terms of interoperability, security, quality, size, partners, etc.

RESEARCH QUESTIONS

In establishing these enablers, the researchers have been guided by the following main research question and sub-question: *How can the effective participation of relevant stakeholders in the development of public e-services be ensured?*

- What are the most appropriate methods to include relevant stakeholders in the development of public e-services?
- What are the drivers and barriers regarding participation of the citizens, public servants, political representatives and software developers (Private/Public)?

ENABLERS

Among the requirements identified in WP3, it was decided to focus more deeply on “Stakeholder Participation”, as the team’s expertise was the strongest for this requirement and this is where it could be the most influential.

First, it was necessary to understand which participation methods are possible to develop e-services. Then, the preference and barriers of stakeholders related to these methods and to user participation are discussed. Finally, recommendations are issued.

PARTICIPATION METHODS

By performing a literature review, we were able to identify a set of eight participation methods that are described below. Each of these methods provides means to realise participation, but the influence of the citizens will be different depending on the context of the specific participation school it is implemented in. The three identified participation schools are the following:

- *Participatory Design* (PD) advocates an approach where good ideas are as likely to come from the user groups than from the decision-makers. In that regard, users and system developers are considered partners in the development process. In the context of this approach, the users can contribute as advisors (by

assessing prototypes), as representatives to represent a particular user group or as all-inclusive participants where all users contribute to the development work.

- *User-Centred Design (UCD)* emerged in the human-computer interaction field and underlines the important impact of user needs on the design of the interface. Contrary to the previous approach, users and developers are not seen as equal because users only provide knowledge to the developers who, consequently, takes into account this business domain knowledge. For instance, the developers could organise focus groups to gather this knowledge but still have the power to take all decision unilaterally.
- *User Innovation (UI)* is the extreme counterpart of non-participation where the problem identification and design solutions emerge directly from the user, or more specifically from the “lead users” group. This sub-group refers to users that have strong needs that will become more general in the marketplaces in the future.

For instance, workshops can be used in the three schools, but how the outcomes of the workshops are taken into account depends on the participation school.

The participation methods are the following (Simonofski et al., 2019):

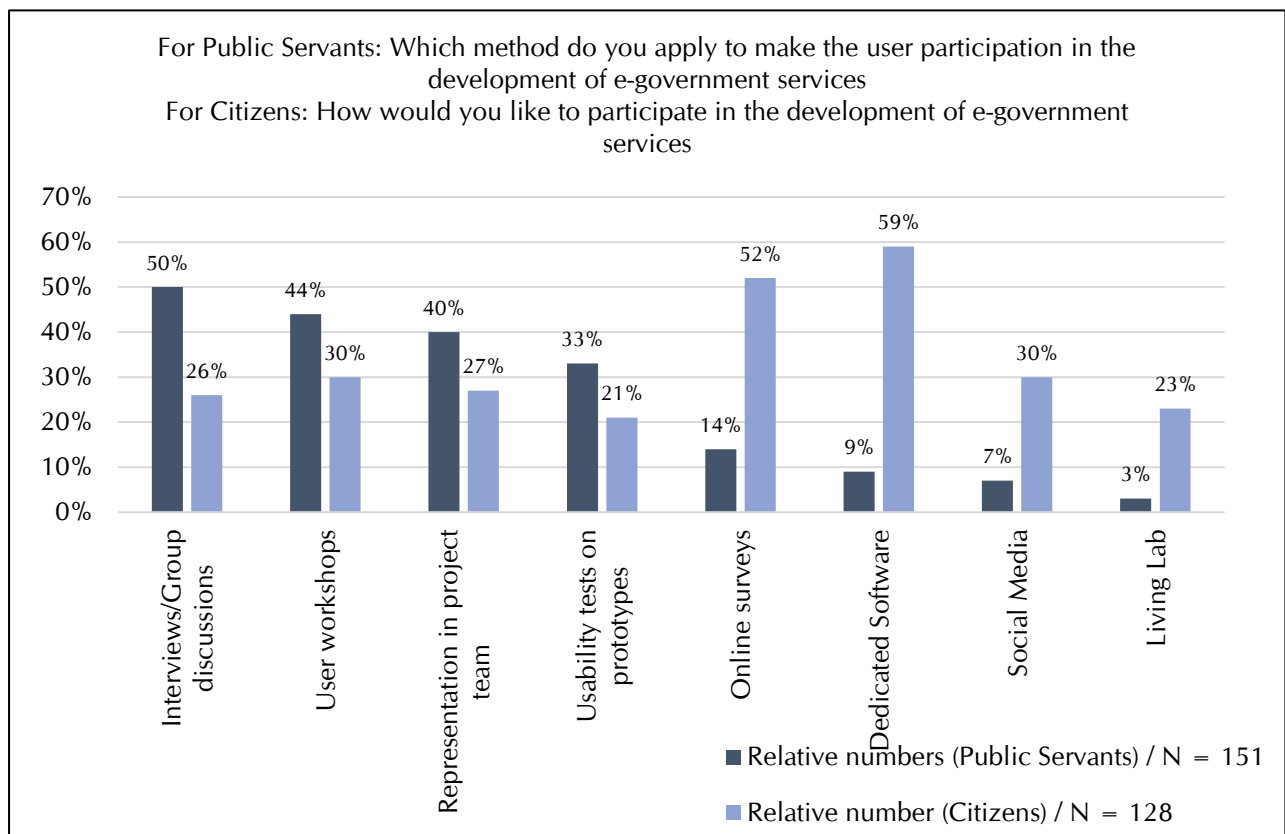
- **Interviews / Group discussions:** Interviews and group discussions are two direct interaction methods often used in the context of requirements engineering. For instance, software developers rely on public servants in interviews and groups discussions as representatives of citizens because they assume they know what the citizens need.
- **Representation in the project team:** In order to give more influence to users, the identification of salient intermediaries representing the users in all development stages (design, development and maintenance) can be considered as a success factor in this regard.
- **User workshops:** The organisation of workshops to interact with a selected group of representative users is a method often used in the requirements identification stage of e-government service development. These workshops can also be organised thanks to creativity techniques such as visualisation tools or improvisation principles.
- **Answer to surveys:** Surveys are used for a number of purposes (market evaluation, research...) but also for the large-scale participation of users, mainly in the evaluation phase of e-government services. This evaluation by users can be done through online surveys, phone or in person surveys.
- **Dedicated Software:** In order to facilitate the large-scale participation of users, practitioners can develop dedicated software (that can take the form of platforms, applications...) to gather citizens' ideas and needs. In the context of e-government service development, Crowd-centric Requirements Engineering (CCRE) platforms apply the crowdsourcing paradigm in all phases of requirements engineering such as elicitation, negotiation and prioritisation.
- **Social Media Channels:** Social Media is disrupting numerous activities including software development. The use of Social Media in an e-government context often refers to the political participation of citizens.
- **Living Lab:** The most recent method resides in the Living Labs, defined as user-driven open innovation ecosystem based on business-citizens-government partnership which enables users to take active part in the research, development and innovation process. This new method is often implemented in a smart city local context to explore the needs and ideas of citizens about innovative ICT projects
- **Usability tests on prototypes:** Prototyping is a method often used to present a non-finished product to its potential users. This is often the basis of user-centric requirement engineering method for the design of e-government services with a rapid prototyping tested through focus groups, interviews or citizen walkthrough.

CITIZENS' PREFERENCES AND USE IN PRACTICE

Based on the findings of WP2, we established the citizens' preferences and the use in practice of the participation methods.

After looking in-depth at the drivers and barriers to the co-creation of e-government services, we will now examine how practitioners implement the participation methods and examine the preferences of citizens regarding these methods. Figure 2 represents this discrepancy by means of relative numbers in order to facilitate comparison.

Figure 2: Participation Methods applied by Public Servants (implementers) and Preference of Citizens (interested Citizens Only)



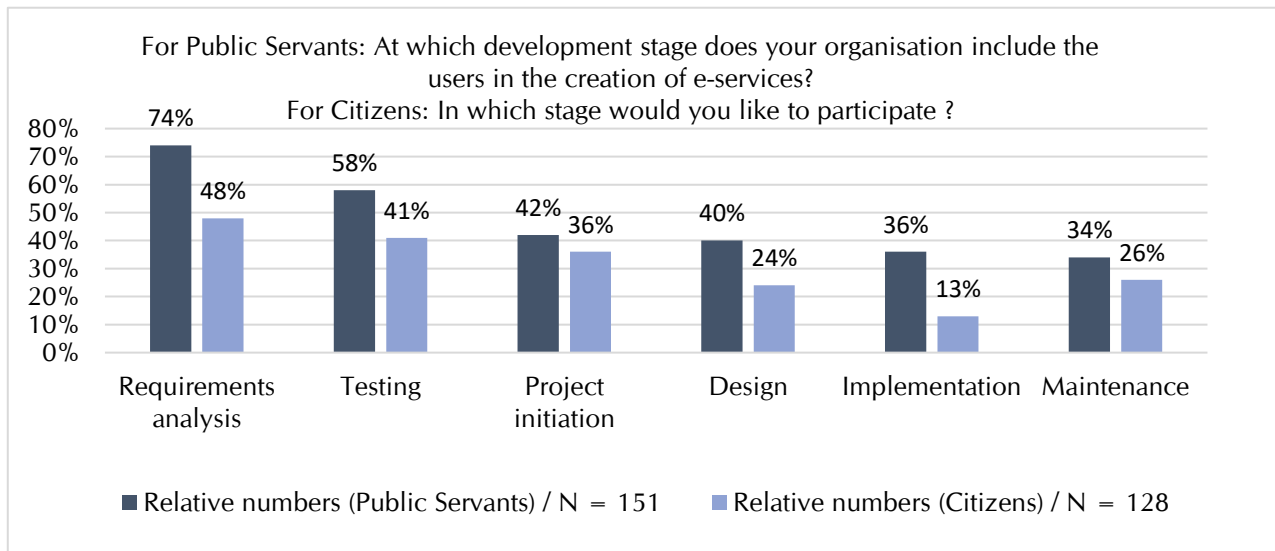
Source: Chantillon et al. (2018)

Regarding the specific method of requirement identification, Figure 2 outlines that there is a clear distinction between traditional small-scale methods that are often used (interviews, group discussions, user workshops, prototyping) and more innovative large-scale methods that are rarely used (online surveys, platforms or social media). It is noticeable that Living Labs are neither largely used nor known amongst the public servants. Furthermore, it must be noted that no major differences concerning the methods used were found between governance levels.

When asking citizens in which phase of the project they would like to be involved in, out of the 203 respondents, 75 were not interested to participate at all in the co-creation of e-government services. For the 128 interested people, the distribution of preferred participation methods can be found in Figure 3. In contrast with public servant's lack of knowledge and use of Living Labs, there seems to be a lot more awareness about this kind of participation structure among the citizens. But Figure 3 also points to several other interesting implications. First, the high number of potentially interested citizens shows that there is an interest from citizens to engage in co-creation if the right opportunity is given to them. Second, there is a clear discrepancy between the methods currently used and the methods preferred by citizens. Citizens tend to prefer large-scale online methods (Dedicated Software, Surveys, Social Media) rather than traditional direct methods currently applied (Focus Groups, Representation in Project team, Interviews). During the interviews, several public agents made clear that there is an interest in those large-

scale methods such as dedicated software. However, several public administrations indicated that they are active on social media, but mainly to share information and only to a limited extend for other reasons. The prototyping option also scores rather high, which shows that many citizens would like to interact with something tangible when they participate.

Figure 3: Inclusion of users in development stages by Public Servants (implementers) and Preferences of Citizens
(Source: Public Servants Questionnaire and Citizen Questionnaire)



Source: Chantillon et al. (2018)

RECOMMENDATIONS (PREFERENCE)

The results above provide evidence for the discrepancies between the methods applied by public servants and the ones that are preferred by citizens. The Comparison Matrix (Table 1) summarises the discrepancy between use in practice and preference by citizens as described in Figure 3, and provides a recommendation for closing the gap.

Table 1: Comparison Matrix

Participation Methods	Use in Practice	Preference by Citizen	Recommendation
Interviews/Discussions	1	6	Improve the method
Workshop	2	5	Improve the method
Rep. in Project Team	3	8	Use in specific cases
Prototypes	4	3	Use the method more extensively
Surveys	5	2	Use the method more extensively
Dedicated Software	6	1	Research the method
Social Media	7	4	Research the method
Living Lab	8	7	Use in specific cases

Source: Simonofski, Snoeck, et al., (2018)

Thanks to these structuring insights, we can draw a number of conclusions. First, there is a clear discrepancy between the use in practice and the preference by citizens.

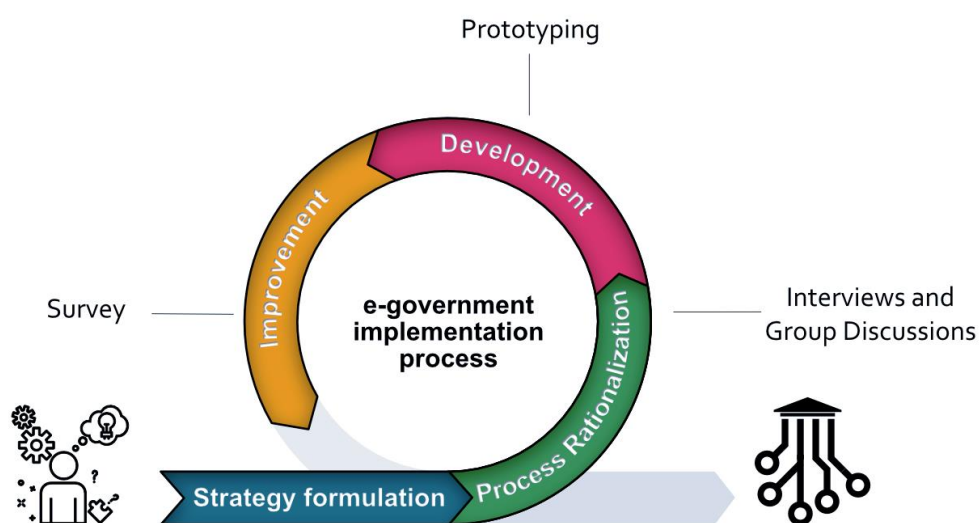
Table 1 also details several recommendations to be taken into account by practitioners or researchers for each method:

- Use the method more extensively (*Medium Use / High Preference*): These methods are used by practitioners and well-accepted by citizens. We thus suggest to use these methods more extensively. Good practices for these more traditional methods can be found in the traditional user participation field.
- Improve the method (*High Use / Low Preference*): These methods are extensively used in practice but score a relatively low preference for citizens. We suggest not to drop these methods (as good practices are already well-established in practice) but research should be performed to understand why citizens don't like these methods. In that regard, research on the motivation and drivers of citizens should be undertaken.
- Research the method (*Low use / High Preference*): The citizens would like to co-create through these methods. Unfortunately, they are not used in practice. These more innovative methods call for research in pilot projects to be undertaken in order to establish a clear methodology integrating these methods.
- Use in specific cases (*Low use / Low Preference*): These methods are rarely used and are not preferred by citizens. Instead of dropping these methods, we suggest to consider them for specific cases (e.g. for lead users or highly motivated citizens). These methods indeed call for an important citizen commitment that could deliver high value but only if the right profile participate. The identification of these lead users in the population for e-government services should be in the research agenda for further studies.

RECOMMENDATIONS (STAGE)

Through action research with an e-government project in Belgium, three different participation methods were used to introduce governance shifts in the e-government strategy of La Louvière: Interviews and Group Discussions, Prototyping, and Online Surveys as indicated in Figure 4 below.

Figure 4: e-Government implementation process



Source: Simonofski, Vanderose, Clarinval, & Snoeck, (2018)

However, many more methods could be applied in this context. Table 2 suggests a participation method matrix where we formulate a hypothesis about the potential relevance of participation methods in each of the four steps of the implementation process. The green cells refer to the methods tested in La Louvière. In blue, we make a positive recommendation since our experience with the studied case and related research suggest that the method could have benefits for the suggested step. In orange, we make a negative recommendation since the methods may not be appropriate to the respective phase.

Table 2: Participation methods matrix

Participation Methods	Strategy Formulation	Process Rationalisation	Development	Improvement
Interview and Group Discussions	Positive	Tested In La Louvière	Positive	Lack of representativeness
Workshops	Positive (H1)	Positive	Positive	Lack of representativeness
Representation in Project Team	Positive	Positive (H2)	Positive	Lack of representativeness
Dedicated Software	Important investment at this stage	Not applicable	Positive	Positive
Living Lab	Important investment at this stage	Not applicable	Positive (H3)	Positive
Prototyping	Not applicable	Not applicable	Tested in La Louvière	Not applicable
Social Media	Too many stakeholders involved	Not applicable	Positive	Positive (H4)
Survey	Too many stakeholders involved	Too many stakeholders involved	Positive	Tested in La Louvière

Source: Simonofski et al. (2018)

All of the cells in Table 2 are leads for further research. The positive and negative recommendations should be tested in concrete settings. Due to space limitations, we only detail here four hypotheses that are particularly promising:

- **H1: Workshops to “Formulate the Strategy”**

In the context of the studied case, no participation methods were applied to formulate the strategy as this was performed by the head of unit of the city in collaboration with the researchers. However, insights to gain ideas from citizens and public servants could have been collected by organising workshops. Indeed, the organisation of workshops to interact with a selected group of representative stakeholders has already been applied in e-government service development (Oostveen & Van Den Besselaar, 2004). The insights gained from workshops can also be helpful in more strategy-related phases before developing the e-government service. Furthermore, as citizens or public servants may be reluctant to speak openly about their ideas and feedback, facilitation techniques should be used. For instance, creativity techniques such as visualisation tools or improvisation principles have already been applied (Mahaux & Maiden, 2008).

- **H2: Representation in Project team to “Rationalise the Processes”**

In La Louvière, the e-government manager and the DMS manager conducted interviews and group discussions to understand the current processes and how they could improve them. However, the participation method was only applied to gain insight from public servants and not of the citizen’s perspective. Furthermore, their impact was limited as they only gave information without contributing any ideas as how best to improve the current situation. In order to give greater influence to users (including citizens), the managers could have included interested public servants or citizens in the project team (or in a steering committee) to gather direct feedback on the rationalisation.

This has already been underlined in literature as Chan and Pan (2008) advocate the identification of salient intermediaries in all phases of an e-government project.

- **H3: Living Lab to “Design the Portal”**

During the development of the portal, the IT manager and the e-government manager used the prototyping technique to get insights from potential users to assess the usability of the portal during its development. We argue that input can and should be gathered in other phases of the software development process as well (requirements, elicitation or implementation). One possible method that allows this end-to-end participation resides in the Living Labs, defined as “user-driven open innovation ecosystem based on a business-citizens-government partnership which enables users to take an active part in the research, development and innovation process” (European Commission, 2009). This method, often implemented in smart cities, can be applied to explore the needs and ideas of citizens regarding e-government projects (Cossetta & Palumbo, 2014). Furthermore, additional activities could be organised within this living lab such as Hackatons to provide citizens with the opportunity to actively participate in the implementation of the solution.

- **H4: Social Media to “Improve the Portal and Strategy”:**

In order to get continuous feedback and ideas about their portal, La Louvière set up an online survey on the portal. However, this will only gain feedback from the people using the platform. Even though this survey gathers relevant feedback, more extensive inputs could be raised by using social media channels. Indeed, the use of Social Media in an e-government context often refers to the political participation of citizens but it can also be used in software development (Storey, Treude, & Van Deursen, 2010). Some authors including Bonsón, Torres, Royo and Flores (2012) have already studied the use of social media in an e-government setting.

5. ORGANISATIONAL STRUCTURES

REQUIREMENTS

APPLICATION OF COORDINATION INSTRUMENTS

The main requirement, resulting from the focus groups (see WP3 Report) was the need to strive for a balance between a common approach on the one hand, and the organisational independence, on the other hand. It is necessary to have a shared and commonly agreed vision and strategic approach for the development of a digital government, complemented with coordination between federal organisations. At the same time, it was underlined that organisations need to be able to act in an independent way to ensure flexibility in their actions. A single dominant actor is, in comparison to other models used in other European countries or Belgian regions, not preferred and would undermine further cooperation between the different federal organisations. One dominant organisation may 'frighten' the other federal organisations. Nevertheless, the participants referred to the importance of having a strong CIO (administrative function, and administratively accountable) or Minister (political function, and politically accountable) which is capable of pushing forward the cooperation, by providing support and/or a general vision. This function has to pull and push when the other federal organisations do not move forward, by providing basic lines for a vision or by supporting the (other) federal organisations.

Currently the federal administration has the G-Cloud which has a Strategic Board and an Operations & Programme Board. It is mainly focused on projects and stimulates the sharing and re-use of digital products and services. The FPS BOSA is responsible for the development of a digital strategy. It was proposed to organise a slight reform in this structure, whereby the G-Cloud and the FPS BOSA would work together towards a vision and strategic approach. In this way, the ownership and involvement of the other federal organisations can be increased, while ensuring sufficient leadership via a single organisation, i.e. the FPS BOSA. Concerning the representation, it was underlined that the G-Cloud results in different IT managers knowing each other. However, not all organisations are represented in a direct way as (1) membership of the G-Cloud is not obligatory and (2) the G-Cloud functions with a model of indirect representation.

COMMON VISION DEVELOPMENT

Another requirement is the creation of a common and shared vision among the federal stakeholders. Specifically, it was underlined that there is a need for an administration simplification and further digitalisation which can only be reached via a common vision. Specifically, references were made to the difficulty of working with *protocol agreements*. Those agreements are used when data is shared between different federal organisations, and include the conditions on the use of data as well as the rights and obligations for the different organisations. Those agreements lead to an increased difficulty in the exchange of data, and have a negative effect on the data re-use. It leads to an increased burden on the administration and demands higher resource investments. Furthermore, certain innovative actions and initiatives are blocked by strict financial rules or require active time planning which lead to inflexible situations. Participants underlined that procurement should, at all time, be respected but, at the same time, it should be made clear that more actions have to be taken to allow for a flexible working environment that does not block innovative solutions or approaches.

(GEOSPATIAL) DATA SHARING ORGANISATIONAL ASPECTS

GEOSPATIAL DATA SHARING PLATFORM

Another requirement put forward by the participants is the increased re-use of (authoritative) data sources, which can then be shared via a 'sharing platform'. Such sharing platforms do already exist in the Belgian context, in the form of "data integrators". Examples are the FPS BOSA, the Crossroads Bank for Social Security, or the Crossroads Bank for Enterprises. It was, however, underlined that the geospatial data sources transferred via the FPS BOSA, as service integrator, remains limited. Therefore, it was proposed to set-up a specific sharing platform for geospatial data sources, which could then also take the form of service integrator for geospatial data sources. However, it was also underlined that this would lead to a duplication of efforts, as an extra service integrator would be created. It

would also reduce the efforts to be made by the original producers of the data to distribute their data. Data producers are often willing to share their data but do not want to bear the (extra) cost of sharing data.

AUTHORITATIVE DATA SOURCES

Concerning the authoritative data sources, there seems to be a demand to increase the number of geospatial data sources that are authoritative. By creating more authoritative data sources, a duplication of efforts can be avoided and different users can work on the same geospatial data sources. This leads to a simplification and efficiency gains. Four points were underlined in this respect. First of all, it was made clear that one of the main requirements for authoritative data is the clarification of who is the lead actor in the source management. This needs a clarification both at the level of the federal administration and often also within the organisation itself. Secondly, organisations often have difficulties in knowing or understanding how their data will be re-used by other actors. If a data source is qualified as authoritative, then it has to be clarified how the actors will re-use the data. Thirdly, it was underlined that the Belgian administrations at federal and regional level take different approaches towards authoritative data sources. Therefore, it was suggested to work on a common approach. Finally, the State Archives underlines that for conservation and archiving reasons it would also be highly interesting to increase the number of authoritative data sources, as it would clarify which data can be preserved for future generations.

STANDARDISATION AND CLEARING HOUSE

In order to ensure that data can be re-used in a simple and flexible way, it was suggested to (further increase) data standardisation. However, it was underlined that it is one of the most difficult tasks to deal with. Insufficient data standardisation is also one of the main reasons why there is still such a strong barrier between geospatial and non-geospatial data sources. Important is the fact that the participants underlined that the data standardisation is seen as something that has to be tackled via a common approach, whereas the distribution (see above 'Sharing platform for geospatial data') and 'data cleaning' was suggested to happen via a single actor. For the data cleaning it was suggested to appoint a clearinghouse which could both judge on topics such as data cleaning, statistical neutrality or privacy and security rules.

REORGANISATION OF THE FEDERAL ADMINISTRATION

One of the most far-reaching aspects that was touched upon was the possible reorganisation of the organisational structure related to geospatial data and functions³². It was proposed that a restructuring of the role of the National Geographic Institute might be beneficial, but that a broader organisational restructuring might be even more beneficial and far-reaching. Concretely, it was suggested to set-up a new organisation which merges the current tasks of the NGI, the FPS Finance – specifically the department responsible for geometric services –, Statistics Belgium and potentially also other units or departments from scientific institutions such as the Royal Belgian Institute for Natural Sciences, the Royal Meteorological Service or the Royal Observatory of Belgium. Furthermore, it was underlined that a strong IT department would also be necessary in such an organisation.

This proposal would lead to a simplification and clarification of the organisational structures of the administration for the topic of geospatial data, but would at the same time require certain investments – especially before, during and right after the merging of those organisations and departments. Furthermore, it has to be underlined that there was, between the participants, disagreement on whether a new organisation should be created grouping the above described organisations/departments or if those organisations/departments could become part of a strengthened NGI.

INTERNAL ORGANISATIONAL COORDINATION

Another requirement is an increased internal organisational coordination. It was recognised that some organisations miss the necessary internal exchange of information on ongoing contacts with external partners. It is a loss of capacity when one actor within an organisation, be it at a higher or equal level, is in negotiation with an organisation, when there is already another actor within the same organisation negotiating on the same topic with the same organisation. These issues can, however, easily be avoided via an open communication and exchange of

³² The team wishes to underline that this element was only mentioned by one participant.

information within one organisation.

LONGTERM POLITICAL SUPPORT FOR RESOURCES AND COORDINATION

When referring to political support, the participants referred to two points. In the first place, it was mentioned several times that more political support is necessary in order to free sufficient resources for the less-visible, but essential functions executed by an organisation, such as the geospatial and/or IT services in different federal organisations. Not only is it a matter of having sufficient financial resources, but also – and even more importantly according to some – it is about the presence of sufficient staff in the organisation that can lead the projects related to geospatial data and/or e-services. A need for more political support is felt on these topics.

Secondly, regarding the coordination, it was underlined that some of the federal public services and some of the social security organisations, have a high level of independence, and will only be prepared to collaborate with each other to a certain extent. Political steering therefore appears, according to the participants, to be a prerequisite to foster the cooperation between the different federal organisations. It has to be underlined that one of the participants pointed to the instability of the Belgian state structure. There is always the possibility that one of the organisations or part of the organisations is regionalised, which can partially undermine the willingness to set-up collaborations with other federal organisations.

COLLABORATION OF BELGIAN ADMINISTRATIONS

It was underlined that the relation between the regions and the federal administration is complex and challenging, and requires an approach that goes further than the current network collaboration that exists between the different Belgian administrations. The fact that the regions, language communities and the federal level are all equal is seen as a problematic aspect blocking further cooperation between the administrations. Therefore, it was proposed that for some policy aspects, where the national interest dominates the regional interest, it should be possible for the federal administration to intervene³³. Examples such as Germany and Switzerland were named by the participants. Furthermore, it was emphasised that the ongoing regionalisation of policy domains creates more complexity as one federal organisation is split in three to four administrations and still requires an exchange of information between them. Once more, this intensifies the already existing coordination issues.

RESEARCH QUESTIONS

In establishing these enablers, the researchers have been guided by the following main research question and sub-question: *How can the organisational structure of the Belgian federal state be constructed to enable flexible and innovative e-services?*

- How can the coordination at the federal administrative level be organised to facilitate the development of e-services?
- Which coordination instruments can be used to facilitate the development of e-services?
- How can the coordination between the federal and regional administrations be organised to facilitate the development of flexible and innovative e-services?
- What kind of organisational structure is necessary to ensure that the respect for the organisational independence and the demand for a stronger coordination is respected?

ENABLERS

Among the seven requirements identified in WP3, it was decided to address five of them, namely “Application of coordination instruments”, “Common vision development”, “Geospatial data sharing organisational aspects”, “Reorganisation of the federal administration” and “Collaboration of Belgian administrations”, as the team’s

³³ Although the installation of a certain level of hierarchy between the regional entities and the federal level was put forward as a requirement, the team emphasises that this is something that cannot be dealt with in the scope of this project. The realisation that there are certain issues with the Belgian federal model is not new, and will always require a political solution that goes further than the scope of the project.

expertise was the strongest for these requirements, and this is where it could be the most influential. The above presented questions will help to find potential enablers for the five selected requirements.

COORDINATION LITERATURE

A review of the coordination literature has been performed, whereby the work of Bouckaert, Peters, and Verhoest (2010) and Meuleman (2008) has been highly useful in light of this study. This literature allows to gain a structured view on the different approaches that are available for public administrations to coordinate their activities. Also, via this work, a definition is provided of what coordination entails, and links are made with organisational structures. In line with Bouckaert et al. (2010), coordination is defined as “the instruments and mechanisms that aim to enhance the voluntary or forced alignment of tasks and efforts of organisations within the public sector. These mechanisms are used in order to create a greater coherence, and to reduce redundancy, lacunae and contradictions within and between policies, implementation or management.”. As mentioned in the definition, there can be different reasons to ensure a stronger coordination: an increase of coherence, a reduction of the redundancy, lacunae and contradictions. At the same time, specialisation of organisations can also lead to a greater efficiency. However, the overall service delivery towards the user is undermined when there is a greater efficiency within the organisation’s specific domain, but also an undermined coherence and exchange of information and data. The question on whether or not coordination is necessary is irrelevant. What matters is the degree of coordination and the type of coordination. Therefore, it is necessary to understand the level of specialisation, as well as the potential instruments that can be applied to intensify the coordination.

Three general coordination approaches are distinguished in the academic literature: hierarchy-related coordination, market-related coordination and network-related coordination. This triangle of coordination approaches is one of the most widely applied approaches in the public administration literature to deal with the topic of coordination (Bouckaert et al., 2010; Meuleman, 2008). A detailed description of the meaning of those three coordination approaches can be found in Chantillon, Cromptvoets & Peristeras (2020). In the Table 3 below, the three approaches are summarised, whereby (1) the base of interaction, (2) purpose, (3) guidance, (4) control & evaluation, (5) resources needed and (6) the theoretical basis, are defined for each approach.

Table 3: Overview of coordination mechanisms

	Hierarchy	Market	Network
Base of interaction	Authority and dominance	Exchange and competition	Cooperation and solidarity
Purpose	Consciously designed and controlled goals	Spontaneously created results	Consciously designed purposes or spontaneously created results
Guidance, control and evaluation	Top-down norms and standards, routines, supervision, inspection, intervention	Supply and demand, price mechanism, self-interest, profit and losses as evaluation, courts, invisible hand	Shared values, common problem analyses, consensus, loyalty, reciprocity, trust, informal evaluation – reputation
Resources needed	Authority, power	Bargaining, information, power	Mutual cooptation, trust
Theoretical basis	Weberian bureaucracy	Neo-institutional economics	Network theory

Source: Bouckaert, Peters, and Verhoest (2010)

Each of those coordination approaches can be related to a number of coordination instruments. Those instruments are presented in Table 4 below. Those coordination instruments are available to public administrations for the coordination of their activities. The instruments are classified as management instruments and structural instruments, whereby for both classes of instruments, hierarchy, market and network related instruments are available. Management instruments refer to the approach that is applied for leading the cooperation between organisations.

Structural instruments refer to the modification of organisations or the creation of other structures to create cooperation between organisations. Structural instruments impact the organisational structures, whereas the management instruments only impact those functioning in the organisational structures and not the organisational structures themselves. In Table 4 below, the instruments are also linked to the coordination capacity (e.g. on which coordination capacity is the instrument relying?). Authority and power refer to hierarchy; bargaining, information and power to market; and mutual cooptation and norms to network. As can be seen, power is both an important source for hierarchy and market.

Table 4: Overview of Governance Coordination Instrument

Instrument	Underlying mechanism	Involved source of coordination capacity					
		Authority	Power	Bargaining	Information	Norms	Mutual cooptation
Management instruments							
1. Strategic management	NTM-HTM						
1.1. Bottom-up and interactive strategic management	NTM			+	+		+
1.2. Top-down and unilateral strategic management	HTM	+	+				
2. Financial management	HTM-MTM-NTM						
2.1. Traditional input-oriented financial management systems	HTM	+	+	+			
2.2. Results-oriented financial management systems focused on incentives for units	MTM			+			
2.3. Results-oriented financial management systems oriented towards information exchnage and consolidation according to policy portfolios	NTM				+		
3. Inter-organisational learning: culture management; competence and information management	Mainly NTM-MTM				+	+	+
4. Procedural instruments concerning	Mainly HTM-NTM	+		(+)	+		

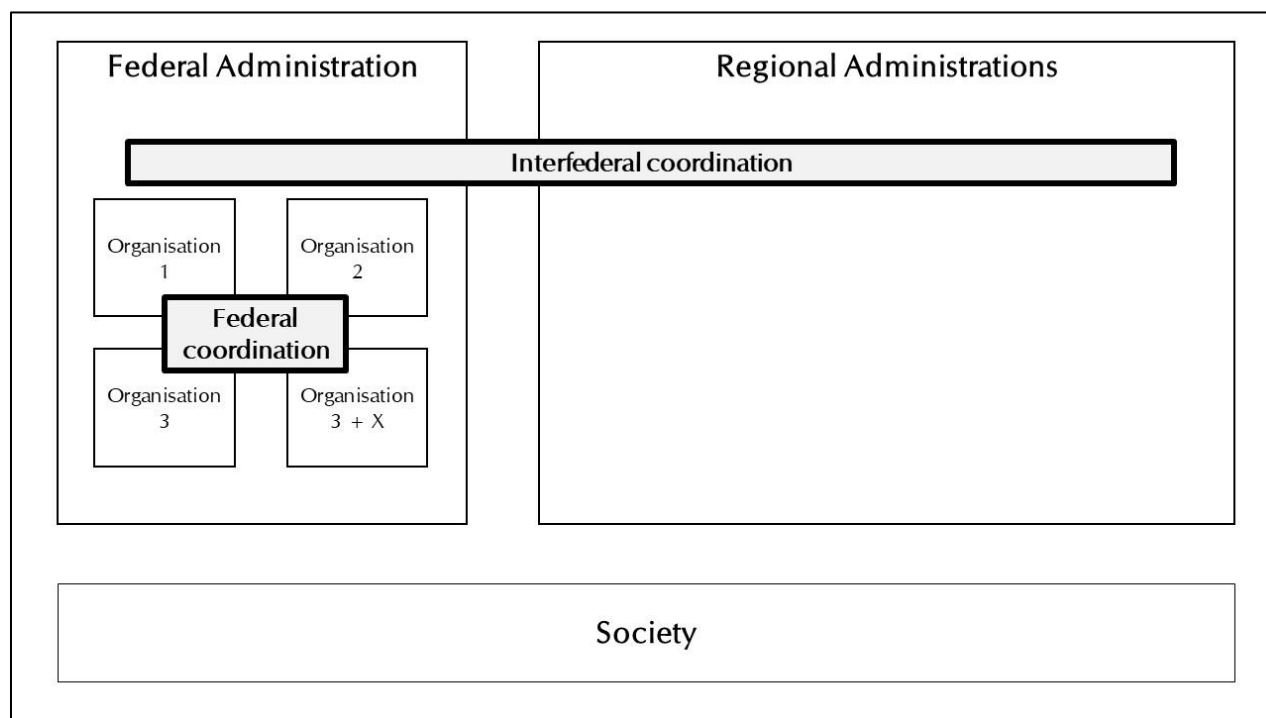
mandated consultation and review							
Structural instruments							
5. Reshuffling of competencies: organisational merger or splits; centralisation or decentralisation	Mainly HTM	+	+				
6. Reshuffling lines of control	Mainly HTM	+	+				
7. Establishment of a specific coordinating function or entity; lines of control	NTM-HTM	+	+	+	+	+	+
8. Regulated markets: internal markets, quasi-markets, voucher markets and external markets	Mainly MTM	(+)		+	+		
9. System for information exchange	Mainly NTM				+		
10. Advisory bodies and consultative/deliberative bodies	Mainly NTM			(+)	+		+
11. Entities for collective decision-making	Mainly NTM			+	+		+
12. Common organisations (partnership organisation)	Mainly NTM (HTM)			+	+	+	+
13. Chain-management structures	Mainly NTM			+	+	+	+

Source: Bouckaert, Peters, and Verhoest (2010) - NTM: Network Type Mechanism / HTM: Hierarchy Type Mechanism / MTM: Market Type Mechanism

On the basis of this coordination instruments' theoretical framework, research was conducted to understand how the use of coordination instruments can enable the different requirements described at the beginning of this section. A combination of various approaches was combined, i.e. 35 interviews conducted between July 2016 and June 2017, two focus groups conducted between November and December 2017, and a documents' analysis covering the period 1995-2019. The documents' analysis allowed the researchers to cross-check the information from the interviews and focus groups to ensure that the factual information provided was correct. During the interviews and focus groups, various enablers were suggested. These have been connected to the above described theoretical framework. The different requirements demonstrate that there are two particular needs, as shown in Figure 5. A first requirement is the need for an increased federal coordination, and a second one is related to the interfederal coordination. Enablers are described below for those two requirements. The above described coordination

instruments can be used to theorise the enablers.

Figure 5: Enabling the coordination requirements



Source: Personal research

INCREASED FEDERAL COORDINATION

Concerning the federal administration, it is important to find a balance between a continuity of the existing organisational structures and the improved coordination. This is necessary (1) to ensure that the existing service delivery is not endangered and (2) to ensure that the staff of the federal administration accepts the suggested modifications. In order to study this enabler, and in line with the following enablers, an international practice comparison has been executed as well as two focus groups. The results of these focus groups have also been discussed in the WP3 Report on the Requirements, and will therefore not be discussed in the same detail as the results of the international practice comparison. In the international practice comparison, we focused on the European Commission eGovernment Benchmarking. The added value of this benchmarking is the fact that the results are highly comparable. It also needs to be underlined that the EU countries have similar levels of development and are confronted with similar – digital and non-digital – challenges. In this respect, the approach in which they organise the coordination within one public administration is highly relevant for any another public administration, such as the Belgian federal administration.

INTERNATIONAL COMPARISON

The eGovernment Benchmark Reports of 2017 were reviewed for those countries that are labelled by the EU Commission as having a Fruitful eGovernment and an Expandable eGovernment. Countries that are labelled as having Fruitful eGovernment score medium-high to high on penetration and digitisation. Those countries are Finland, Denmark, Estonia, Sweden, The Netherlands, Lithuania, Latvia and Spain. Countries that are labelled as having Expandable eGovernment score low to medium-low on penetration, and medium-high to high on digitisation. Those countries are Austria, Germany, Portugal and Malta. Belgium is also part of this group, but is – as this research is focused on the Belgian federal administration – excluded from this exercise. Besides those countries, it was also decided to include three other countries for their geographical proximity with Belgium, namely the United Kingdom, France and Luxembourg. The United Kingdom and France are labelled as Unexploited

eGovernment. This refers to medium-high to high penetration rate, and a low to medium-low digitisation. Luxembourg is labelled as Non-consolidated eGovernment, referring to a low to medium-low penetration and digitisation. Finally, it was also decided to include three countries that are not EU Member States, but that participate in the eGovernment Benchmarking exercise, i.e. Norway, Liechtenstein and Iceland. Those countries did not receive a label from the European Commission.

The analysis results are presented in Table 5. The coordination approach for the different analysed countries is structured around a number of phases in the development of e-policies and e-services: Policy-strategy, Coordination, Implementation and Support. Note that not all phases are described for each country. This depends on the information provided by the countries to the European Commission.

Besides the highly detailed factual information on how different European countries coordinate their e-government policies and e-services, which can support Belgian public administrations in understanding the functioning of other countries, this data also provides a number of insights that are relevant for the enablers studied in this report. What is clear from the provided data is that those countries which are considered to have a Fruitful eGovernment, or an Expandable eGovernment, all apply a combination of hierarchy and network related coordination instruments. There seems to be two types of approaches. In some case, there is a single leading actor, which takes into account the needs of the other actors. In other cases, there is a collaboration between different actors. All countries also define a strategy, which is shared and to be implemented by the different organisations targeted via this strategy. From an organisational perspective, the implementation is also widely supported and there is clear support coordination approach. It is also interesting that some countries have an e-government department or unit, which takes a leading role, and which is part of the Ministry of Finance. This is interesting, but it has to be underlined that the connection to a thematic ministry can lead to a focus on specific public values. The research of Bøgh Andersen, Jørgensen, Kjeldsen, Holm Pedersen, & Vrangbæk (2013), Jørgensen & Vrangbæk (2011) and Vrangbæk (2003), showed that the Danish e-government strategy defined by the e-government department, which was part of the Ministry of Finance, focused much more on public values related to the Ministry of Finance, then to other public values. Therefore, and in order to ensure an independent focus on public values, it is important (1) to connect the e-government strategy to a non-thematically centered organisation or (2) to a group of different organisations that commonly define the e-government strategy.

Table 5: International Comparison of European countries

Country	Coordination approach
UK	<ul style="list-style-type: none"> • National UK Level: <ul style="list-style-type: none"> ○ Policy-strategy: Cabinet Office (overall responsibility for government efficiency and reforms, also for e-government), and in particular the Government Digital Service (in control of overall user experience across all digital channels). ○ Coordination: Cabinet Office, and in particular the Efficiency & Reform Group: tackle waste, improve accountability and efficiency across all government departments ○ Implementation: Technology Leaders Network, lead by Government Digital Service, consisting of an IT leader from each government department as well as the Technology Leaders of the four Devolved Administrations, and the Digital Leaders Network. ○ Support: Efficiency & Reform Group • Decentralised Level <ul style="list-style-type: none"> ○ England: decentralised - local responsibility ○ Scotland: decentralised - local responsibility, but supported by Customer First (managed by scottish government and scottish local authorities)

	<ul style="list-style-type: none"> ○ Wales: decentralised - local responsibility, but supported by Public Service Leadership Group (chaired by Minister for Local Government and Communities) and Office of the Chief Information Officer (coordination and leading the IT strategy) ○ Northern Ireland: decentralised - local responsibility, but supported by the Department of Finance & Personnel (Delivery and Innovation Division)
Finland	<ul style="list-style-type: none"> • Policy-strategy: <ul style="list-style-type: none"> ○ Sector ICT Department (Ministry of Finance) is in charge of the “overall development of eGovernment, Public Administration information management, corporate data and information management governance in central Government, [it] formulates joint functional solutions and methods and is in charge of the overall development of information security in Public Administration, as well as data security governance in central Government.”. ○ Communication Policy Department (Ministry of Transport & Communications) is in charge of “legislation related to infrastructure, i.e. communications networks, data protection and data security questions.”. • Coordination of the ICT policies is organised by the Development and Coordination Committee of Information Management (TIETOKEKO). <p>Besides the above described coordination approach, the Finish administration focusses on the development of legal acts anchoring the desired coordination approach. Examples include:</p> <ul style="list-style-type: none"> • <i>Act on Shared Support Services for eGovernment</i> with the puprose of improving the availability, quality, data security, interoperability, steering of public services and to promote the effectiveness and productivity of public administrations; • <i>Act on Government's common ICT-services</i>: “Valtori is responsible for providing and producing common ICT services like data centers, networks, workstations and communication services. The scope of Valtori’s services includes also support for eServices and generic software services. The government organisations are still responsible for the development operation and support for the business specific software”; • <i>Act on Information Management Governance in Public Administration</i>: “Ministry of Finance has to be consulted when it comes to significant ICT procurement”; • <i>Act on Shared Support Services for eGovernment</i>: “Current responsibilities for providing support services for eGovernment are specified, so that they are in accordance with the national architecture for digital services. Support services are mainly provided by the Population Register Centre; known as Suomi.fi services”.
Sweden	<ul style="list-style-type: none"> • Policy-strategy is developed by the e-Government Unit, which moved in 2016 from the Ministry of Enterprise & Innovation to the Ministry of Finance. • Coordination is organised via a number of actors: <ul style="list-style-type: none"> ○ Swedish National Financial Management Authority (Ekonomistyrningsverket) promotes digital collaboration and the increase of ICT governance in government agencies; ○ eSamverkansprogrammet (The programme for eCollaboration) consist of former members of eGov Delegation and is lead by the Pensions Agency; ○ Legal, Financial and Administrative Services Agency and National Procurement Services (Kammarkollegiet) are responsible for public procurement, and as such also for everything related to e-government and procurement.

	<ul style="list-style-type: none"> • Support is organised via a number of actors: <ul style="list-style-type: none"> ○ Swedish Agency for Public Management (Statskontoret) provides modernisation support via studies and evaluations, upon the governments request; ○ Swedish Post and Telecom Agency (PTS) ensures access to efficient, affordable & secure communication services; ○ Digitisation Council has an advisory role; ○ IT Incident Centre provides ICT support in case of emergency situations.
The Netherlands	<ul style="list-style-type: none"> • Policy-strategy is developed by the Ministry of Interior and Kingdom Relations (overall view, together with the Digital Commissioner), the Ministry of Economic Affairs (business aspect), the Ministry for Housing and the Central Government Sector (administrative reform aspect). Each Minister is furthermore responsible for its own domain. • Implementation is done by all responsible actors, support is provided by ICTU (Innovative ICT organisation, independent actors within the public sector) and Logius (an Agency within the Ministry of Interior and Kingdom Relations). Logius develops government-wide ICT solutions and standards, and also has a standardisation secretariat. • The Central Government iStrategy (2016) aims at downsizing the administration, make it more efficient. Priorities are the following: iFunction is core, digitalisation of primary processes, central government as a connected enterprise, information security, continuity and privacy, optimal use of internal & external suppliers. The iStrategy builds on the Compact Central Government Implementation Programme, that aims to ensure that budget profits are redirected to administrations which suffered budget losses. The iStrategy still exists but in an updated format (Minister van Binnenlandse Zaken en Koninkrijksrelaties, 2019; Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2019).
Denmark	<ul style="list-style-type: none"> • Policy-strategy is developed by the Ministry of Finance (acts as main initiator, and especially the Agency for Digitisation that contributes to the political vision and the strategy development. Also involved are the Ministry of Industry, Business & Financial Affairs (digital aspects of businesses) and the Ministry of Energy, Utilities & Climate (telecommunication policy - e.g. aspects such as roaming, competition, mobile & broadband). • Coordination is undertaken by the Ministry of Finance (especially the Agency for Digitisation that focusses on strategic, professional and technical competences, also responsible for the coordination of the eGov Strategy as well as the Steering Committee for the eGov Strategy). Another actor responsible for the coordination is the Agency for Governmental IT Services, which is responsible for proving the support to ensure efficient administrative IT services and consistent IT services in government. • Implementation is conducted by the Ministry of Finance (Agency for Digitisation), as well as the different responsible ministries, departments and agencies. • Support is provided by the Ministry of Finance (Agency for Digitisation).
France	<ul style="list-style-type: none"> • Policy-strategy is developed by the Secretary of State responsible for reform and simplification of the State (falls under the responsibility of the Prime Minister, and is responsible for the coordination of the state modernisation and simplification). The General Secretariat for Government Modernisation (SGMAP - Secrétariat général pour la modernisation de l'action publique), which has been created in 2012 and also falls under the Prime Minister's responsibility, also plays a role in the policy-strategy phase. The SGMAP works for various ministers.

	<ul style="list-style-type: none"> • Coordination is led by the SGMAP. • Implementation is led by the SGMAP. Note that the Direction interministérielle du numérique et du système d'information et de communication de l'État (DINSIC) is responsible for the e-government developments, together with the central government departments of the various ministries. • Support is provided by the SGMAP, the National Digital Council (internet specialist - consultation), Direction de l'information légale et administrative (DLA, which is part of the SGMAP) and public interest groups. The Caisse des Dépôts provides financial support, when necessary.
Austria	<ul style="list-style-type: none"> • Policy-strategy is developed by the State Secretary within the federal Chancellery, and is thereby supported by Platform Digital Austria (functions in an inter-governmental way, and is headed by the CIO of the federal government, and it is supported by the federal ICT Strategy Unit), as well as the Directorate on Digital and e-Government (part of the federal Chancellery responsible for legal and organisational issues, coordination of technical infrastructure, project management, budget control, procurement, international issues). • Implementation is conducted by the federal ministries themselves, support is provided by the EGIZ (e-government innovation centre - research group on digital innovation) and the Austrian federal computing centre (state-owned company, responsible for implementing e-government solutions). • Note that the Directorate on Digital and e-Government (part of the federal Chancellery) takes a much broader role than policy-strategy. Indeed, it also takes a coordination, implementation and support role.
Estonia	<ul style="list-style-type: none"> • Policy-strategy is developed by: <ul style="list-style-type: none"> ◦ The Ministry of Economic Affairs and Communications, and in particular the Department of State Information Systems (RISO). The minister responsible for this ministry also has the political responsibility. The department develops policies, coordination and development plans. ◦ Also important in the policy-strategy phase is the Estonian Association of Information Technology and Telecommunications (a non-profit organisation, which focusses on businesses) and the e-Estonia Council (a government committee which focusses on development of digital society and e-government: it consists of five experts and three ministers, and is chaired by the Prime Minister). • Coordination is led by: <ul style="list-style-type: none"> ◦ The Ministry of Economic Affairs and Communications, and in particular the RISO. This ministry and department functions as the main coordinator. ◦ Furthermore, the Department of Information Society Services Development is responsible for the coordination of public sector service development, the Estonian Information System Authority is responsible for the coordination of key public infrastructures, the non-profit Estonian Association of Information Technology & Telecommunications also provides support as well as the e-Estonia Council. • Implementation is led by the Ministry of Economic Affairs and Communications, and in particular the RISO. Support in the implementation is also provided by the Estonian Information System Authority and the various government ministries, departments and agencies.

	<ul style="list-style-type: none"> Support is provided by the e-Estonia Council (responsible for the overall coordination & policy formulation) and the CERT Estonia (responsible for digital security).
Germany	<ul style="list-style-type: none"> Policy-strategy is defined by the Federal Ministry of the Interior, together with the federal Government Commissioner for Information Technology (founded in 2008, responsible for the eGov & IT security strategy and architecture, the development of standards and methods and the control provision of central IT infrastructure, and also chairs the IT council) and the IT steering group (supreme body of federal IT managers). Coordination is done by the Federal Ministry of the Interior and the federal Government Commission for Information Technology. Implementation is done by the German Federal Office of Administration, which is the central public service agency, and the federal ministries. Support is provided by the Federal Office for Information Security, which is the central IT security provider.
Iceland	<ul style="list-style-type: none"> Policy-strategy is defined by the Ministry of the Interior. Implementation is highly decentralised, whereby the focus lies on “ePower Expansion”: “democracy”, “efficiency”, “needs of people” and “needs of industry”.
Latvia	<p>The overall responsibility is taken by the Ministry of Environmental Protection and Regional Development. It functions as the leading regulatory authority, and there are specific departments playing a role:</p> <ul style="list-style-type: none"> Policy-strategy: 1) Electronic Government Department (responsible for national policies on e-government, information society development and public information systems development) and 2) Public Services Department (responsible for planning of electronic services, electronic services infrastructure and one-stop shop division). Coordination: 1) Electronic Government Department and 2) Public Services Department. Implementation: 1) Electronic Government Department, 2) Public Services Department and 3) State Regional Development Agency. Besides those three actors, other central actors are also responsible for the implementation in their organisation. Support is provided by the same ministry.
Liechtenstein	<ul style="list-style-type: none"> Policy-strategy is defined by the Ministry of General Government Affairs and Finance, whereby the leading principles are “timeliness” and “balance”. Coordination is led by the Office of Information Technology, whereby the leading principles are “easier”, “quicker”, “efficient”, “effective” and “user centricity”. Implementation is led by the Office of Information Technology, whereby the leading principles are “easier”, “quicker”, “efficient”, “effective” and “user centricity”. Support is given by the Office of Information Technology, whereby the leading principles are “easier”, “quicker”, “efficient”, “effective” and “user centricity”.
Lithuania	<ul style="list-style-type: none"> Policy-strategy is defined by the Ministry of the Interior, and in particular the Public Administration Policy Department that shapes the public policy for e-government and information technology security. It is also responsible for developing e-government legislation.

	<ul style="list-style-type: none"> • Coordination is conducted by the Ministry of the Interior, and in particular the Public Administration Policy Department that is responsible for the overall coordination of the implementation. The Information Society Development Committee also has a role. • Implementation is done by the Ministry of the Interior, and in particular the Public Administration Policy Department, but only for the strategic ICT projects. The Information Society Development Committee is responsible for the management and development of central digital government enablers. Other ministries and state Institutions are responsible for the implementation in their organisations.
Luxembourg	<ul style="list-style-type: none"> • Policy-strategy is developed by the Ministry of State (Media and Communications Service – responsible for the coordination and development of national communication infrastructure), the Ministry of the Economy (business environment), the Ministry of Finance (financial sector focus), the Ministry of Higher Education and Research (promoting e-skills, IT training and R&D programmes in IT), the Ministry of the Civil Service and Administrative Reform (overall e-government strategy and policy) and the Ministry of the Civil Service and Administrative Reform (and in particular the Government IT Centre that is the main actor for e-government, IT and state modernisation via ICT). • Coordination is done via the Ministry of the Civil Service and Administrative Reform, and in particular the Government IT Centre: coordination of automisation processes, administrative processes, interoperability, support to other actors and identification of synergies. • Implementation runs via the Ministry of the Civil Service and Administrative Reform, and in particular the Government IT Centre: provide overall support to other state actors and ensure implementation of government programme and e-government master plan. Ministries then implement these in their organisations. • Support is provided by the Ministry of the Civil Service and Administrative Reform, and in particular the Government IT Centre.
Malta	<p>The overall responsibility is taken by the Ministry of Competitiveness and Digital, Marine and Service Economy (MCDMS) and the Ministry for the Economy, Investment, and Small Business, and in particular the following agency: Malta Information Technolgy Agency (MITA).</p> <ul style="list-style-type: none"> • Policy-strategy: MITA is responsible for the delivery of the Digital Malta Strategy, thereby following instructions of the Minister. Its role is to propagate the use of ICT in society and economy. • Coordination is conducted by MITA (prioritisation of ICT targets, embrace open standards and technologies, deliver and manage programme executions, promotion and delivery of programmes) and the broader Ministry of Competitiveness and Digital, Maritime and Services Economy (responsible for the coordination of MITA as well as the Malta Communications Authority). Coordination is also conducted by the Digital Malta Governing Board (ensures strong governance via dependency and risk management by adoption of policies & actions). • Implementation is led by MITA, which is responsible for the implementation of the Digital Malta Strategy. There is a specific role for the Technology Direction & eGovernment Department, which has technological focus, and the Programme Management Department, which is responsible for the implementation of different strategic sections within government. The Malta Communications Authority is also responsible for the implementation. • Support is provided by the Malta Communications Authority (responsible for the regulation of the electronic communications sector), the Office of the Prime Minister (in particular the Management Efficiency Unit that assists the administration in developing and implementing

	the change management strategies) and the Department of Information (responsible for the management of the government portal).
Norway	<ul style="list-style-type: none"> • Policy-strategy is defined by the Ministry of Local Government & Modernisation, and in particular the Department of ICT policy & Public Sector Reform that is responsible for the administration and modernisation of public sector as well as the ICT policy. This Ministry, and department, oversees the Agency for Public Management and eGovernment (DIFI). • Coordination is conducted by the Ministry of Local Government & Modernisation (overall coordination) and DIFI (strengthen coordination and ensure standardisation of ICT developments). • Implementation is led by the Ministry of Local Government & Modernisation (overall policy implications, horizontal presence of implementation process, initiates the change) and DIFI (implementation of projects and activities). • Support is provided by the Ministry of Local Government & Modernisation, the Government Administration Services (offers cost effective and reliable shared services), the Norwegian Centre for Information Security (advising and guiding institution for information security), ICT-Norway (representation of ICT-industry) and Abelia (improve business environment to contribute to economic growth & social progress).
Portugal	<ul style="list-style-type: none"> • Policy-strategy is defined by the Minister of the Presidency and Administrative Modernisation, the Assistant Secretary of State of Administrative Modernisation and the Administrative Modernisation Agency (AMA), which is responsible for public services modernisation as well as administrative and regulatory simplification. • Implementation is led by AMA, charged with the modernisation and simplification of public services and e-administration. Also, the individual administrations are responsible for the implementation in their organisation. • Support is provided by the Organisation for Information and Communication Technology (CEGER), which is specifically responsible for the management of the technological infrastructure.
Spain	<ul style="list-style-type: none"> • Policy-strategy is developed by the General Secretariat of Digital Administration, the Commission for ICT Strategy (an inter-ministerial body) that is responsible for the preparation, design and development of the e-government strategy and ICT policy, and the Ministry of Energy, Tourism & Digital Agenda, which is responsible for the Telecom and Information Society Strategy. • Coordination is conducted by the Commission for ICT Strategy and the Ministerial Committees for Digital Government. • Implementation as well as support is done and provided by the Ministry of Finance and Public Function (Directorate for Information Technologies and Communications) that is responsible for the implementation of information systems, standardisation of services, processes and documents, the provision of technical support by assessing e-government actions, and the drafting of recommendations. Also, implementation and support is provided by the National Cryptologic Centre (security cryptology), the Ministry of Energy, Tourism and Digital Agenda (information society and digital agenda), the Ministry of the Interior (implementation of ID card project), the individual administrations, Red.es (public corporate entity attached to the Ministry of Energy, Tourism and Digital Agenda) and ASTIC (association of IT experts and managers in the central government).

Source: European Commission (2017a)

FOCUS GROUPS

A number of specific enablers have been mentioned during the focus groups. A detailed overview of the requirements can be found in the WP3 Report on requirements, as well as at the beginning of this chapter. A number of those requirements can also be translated into enablers for a stronger coordination of activities among the different organisations of the federal administration.

DEVELOPING A COMMON APPROACH

One of the enablers suggested by the participants was the installation of a strong CIO (administrative function, and administratively accountable) or Minister (political function, and politically accountable), which is capable of pushing forward the cooperation, by providing support and/or a general vision. This function has to pull and push when the other federal organisations do not move forward, by providing basic lines for a vision or by supporting the (other) federal organisations. Currently, the federal administration has the G-Cloud, which has a Strategic Board and an Operations & Programme Board. It is mainly focused on projects and stimulates the sharing and re-use of digital products and services. The FPS BOSA is responsible for the development of a digital strategy. To enable the development of a common approach, it was proposed by the focus group participants to organise a slight reform in this structure, whereby the G-Cloud and the FPS BOSA would work together towards a common vision and strategic approach. In this way, the ownership and involvement of the other federal organisations can be increased, while ensuring sufficient leadership via a single organisation, i.e. the FPS BOSA. Concerning the representation, it was underlined that the G-Cloud is composed of different IT managers knowing each other. However, not all organisations are represented in a direct way as (1) membership of the G-Cloud is not obligatory and (2) the G-Cloud functions with a model of indirect representation. Full ownership by all federal administrations of the G-Cloud initiative can only be achieved by increasing the number of member organisations.

Crucial in the enabling of a common approach, is the insurance that federal organisations remain sufficiently independent. A too tight framework would lead to resistance from the federal organisations and undermine the potential of a common approach. From a theoretical perspective, this approach could be labelled as a Network Type Mechanism (NTM), as all parties involved need to agree on a commonly defined approach. One actor will be able to steer the direction of the approach and has been legally charged with the development of a Strategy (FPS BOSA). Therefore, it can also be argued that there is Hierarchy Type Mechanism (HTM) at play in this approach. From the focus group results, it can be derived that a common approach can be enabled via a combination of an NTM and HTM approach.

STIMULATING (GEOSPATIAL) DATA SHARING

A number of potential enablers were mentioned by the focus group respondents. A first enabler to stimulate the sharing of (geospatial) data was the development of a sharing platform for geospatial data. Such sharing platforms already exist in the form of “data integrators”. It was however underlined that the geospatial data sources transferred via the FPS BOSA, as service integrator, remain limited. Therefore, it was proposed to set-up a specific sharing platform for geospatial data sources, which could then also take the form of service integrator for geospatial data sources. However, it was at the same time underlined that this would lead to a duplication of efforts, as an extra service integrator would be created. This can be solved in two ways: (i) By creating bridges between the different service integrators, to ensure that the data exchange between those actors is also increased, or (ii) by increasing the attention of the FPS BOSA as service integrator for geospatial data sources. Nevertheless, a closer collaboration between the different service integrators would enable a strong geospatial data sharing.

Secondly, an increasing investment in authoritative data sources is also considered as an enabler for the stimulation of (geospatial) data sharing. From the focus groups, it became clear that there is a demand to increase the number of geospatial data sources that are authoritative. By creating more authoritative data sources, a duplication of efforts can be avoided and different users can work on the same geospatial data sources. This leads to a simplification if data sources are later put together again. Four points were underlined in this respect. First of all, it was made clear that one of the main requirements for authoritative data sources is the clarification of who is the lead actor in the

source management. This needs a clarification both at the level of the federal administration and often also within the organisation itself. Secondly, organisations often have difficulties in knowing or understanding how their data will be re-used by other actors. If a data source is qualified as authoritative data source, then of course it has to be first clarified how the different actors will re-use the data. Thirdly, participants underlined that the Belgian administrations at federal and regional level take different approaches for their authoritative data sources. Therefore, it was suggested to work towards a common solution, which could, for example, include the recognition of authoritative data sources of one administration by another administration. Finally, the State Archives underlines that for conservation and archiving reasons, it would also be highly interesting to increase the number of authoritative data sources, as it would clarify which data can be preserved for future generations.

A final and third enabler referred to by the respondent is the importance of further data standardisation, and the development of an appropriate system for this. According to the focus group participants, the data standardisation has to be tackled via a common approach, whereas the distribution (see above “Sharing platform for geospatial data”) and “data cleaning” was suggested to happen via a single actor. For the data cleaning, it was suggested to appoint a clearinghouse which could both judge on topics such as data cleaning, statistical neutrality or privacy and security rules.

UPDATING THE GEOSPATIAL ORGANISATIONAL STRUCTURES

In order to deal with the changing needs of the federal administration, the different regional actors and the broader society, it was underlined during the focus groups that a reshuffling of competencies among the different federal organisations dealing with geospatial information and data is necessary. This will enable the increasing and more efficient use of geospatial information and data, the intensification of the previously described aspect – i.e. stimulating (geospatial) data sharing – and the increased re-use of data. The expertise in the organisation would grow and be beneficial for the entire federal administration, as well as the whole country. It was proposed that a restructuring of the role of the National Geographic Institute might be beneficial, but that a broader organisational restructuring might be even more beneficial and far-reaching. Concretely it was suggested to set-up a new organisation which merges the current tasks of the NGI, the FPS Finance – specifically the department responsible for geometric services –, and potentially also other units or departments from scientific institutions such as the Royal Belgian Institute for Natural Sciences, the Royal Meteorological Service or the Royal Observatory of Belgium. Furthermore, it was underlined that a strong IT department would also be necessary in such an organisation.

Furthermore, this proposal would lead to a simplification and clarification of the organisational structures of the administration for the topic of geospatial data. At the same time, it also requires certain investments – especially before, during and right after the merging of those organisations and departments. Finally, it has to be underlined that there was, between the participants, disagreement on whether a new organisation should be created grouping the above describe organisations/departments, or if those organisations/departments could become part of a strengthened NGI.

INTERFEDERAL COORDINATION

Looking at the interfederal coordination, it is important to underline that the possibilities to intensify the coordination between the various public administrations³⁴ can only be increased via network-related structural and management instruments. Indeed, as the Belgian federal system is built on equality between the different public administrations, meaning that there is no hierarchical relation between them, the coordination needs to be organised via network-related instruments. This also means that the public administrations working on coordination need to see an added value for themselves. If they are not able to detect added value in the long, middle or short term, there can be no coordination among them.

³⁴ The public administrations that the researchers refer to here are the federal public administration and the three regional public administration (i.e. Brussels Capital Region Administration, Walloon Administration and Flemish Administration). The three language-community public administrations are not taken into account here, as their competencies concerning geospatial information are highly limited.

INTERNATIONAL COMPARISON

An international comparison of other countries was also conducted for this requirement. Although the federal approach taken in Belgium is highly specific, there are a number of international practices which can be classified as network instrument that can also be useful in the Belgian context.

The eGovernment Benchmark Reports of 2017 were reviewed for those countries that are labelled by the EU Commission as having a Fruitful eGovernment and an Expandable eGovernment. Countries that are labelled as having Fruitful eGovernment score medium-high to high on penetration and digitisation. Those countries are Finland, Denmark, Estonia, Sweden, The Netherlands, Lithuania, Latvia and Spain. Countries that are labelled as having Expandable eGovernment score low to medium-low on penetration, and medium-high to high on digitisation. Those countries are Austria, Germany, Portugal and Malta. Belgium is also part of this group, but is – as this research is focused on the Belgian federal administration – excluded from this exercise. Besides those countries, it was also decided to include three other countries for their geographical proximity with Belgium, namely the United Kingdom, France and Luxembourg. The United Kingdom and France are labelled as Unexploited eGovernment. This refers to medium-high to high penetration rate, and a low to medium-low digitisation. Luxembourg is labelled as Non-consolidated eGovernment, referring to a low to medium-low penetration and digitisation. Finally, it was also decided to include three countries that are not EU Member States, but that participate in the eGovernment Benchmarking exercise, i.e. Norway, Liechtenstein and Iceland. Those countries did not receive a label from the European Commission.

Table 6 provides an overview of the various approaches that are taken in other European countries. Almost all of the countries that have been studied in this comparison function as centralised states. Only Germany and Spain have also a federalised state structure. Germany combines both network and hierarchy related instruments. On the one hand, the federal administration has used the possibilities offered by the German constitution to instal a hierarchical way of working between the federal administration and the state (Länder) administrations. This hierarchical way of working only applies to a number of topics. Besides the hierarchical way of working, the German federal administration and state (Länder) administration also have a coordination body, the so-called IT-Planungsrat. This body is charged with “the coordination of the IT-cooperation between federal government and Länder as well as agreeing on policy-independent and interdisciplinary IT-interoperability and IT-security-standards” (Heuberger, 2019). In 2020, a second body has been added, the so-called federal IT coordination body (Föderale IT-Koordinierungsstelle), which is a mixed multi-level administration with representatives of the federal administration and the regional (Länder) administrations. The federal IT coordination has been set-up by the IT-Planungsrat and will coordinate “the cooperation between all federal levels not only generally but also based on specific projects [and function] as a platform for better communication and exchange of experiences” (Heuberger, 2019). Besides those structural coordination mechanisms, Germany also applied a number of management coordination instruments, such as the development of a common strategy.

Spain applies a pure network approach via two mechanisms. The overall coordination is organised via a specific body with a technical orientation that groups the different Spanish administrations, namely the Sectoral Committee of eGovernment. One of the topics on which this body works is interoperability. Furthermore, the federal administration also provides support for the local and regional administrations via the central administration’s Directorate for Information Technologies & Communications. The Spanish approach of only applying network related instruments is thus more in line with the approach that is constitutionally possible within the Belgian context.

Table 6: International Comparison of European countries

Country	Coordination approach
UK	Implementation of e-government policies happens via Technology Leaders Network and Digital Leaders Network.
Finland	<ul style="list-style-type: none">• International cooperation

	<ul style="list-style-type: none"> ○ between Finland and Estonia to make the data on their respective databases available and interchangeable for citizens and business across the two countries, ensuring cross-border services; ○ between Denmark, Finland, Norway and Sweden to share national Open Government Policies work and promote open data. • Digitalisation Program is valid for both central and local administrations, but not for the other Finnish administrations. • Coordination runs via <ul style="list-style-type: none"> ○ JUHTA (i.e. Advisory Committee on Information Management in Public Administration) which "coordinates the development of information technology, information management and electronic services in central and local Government, and draws up relevant recommendations"; ○ Advisory Committee on Government Security Network that brings together central government and local authorities to "participate in the preparation of decrees, orders and decisions issued based on the provisions contained in the Act on Government Security Network activities and other matters related to security network activities" ○ Public Sector Digital Security Management Board (VAHTI) which functions as a "forum for cooperation and coordination among government organisations in charge of the development and steering of information security and data protection". • Implementation and support are provided via VALTORI. It provides support for central and local administrations.
Sweden	<ul style="list-style-type: none"> • International cooperation: see Finland. • Coordination via meeting platform "Share Digital", which groups 290 municipalities, 21 country councils/regions and 300 government agencies. It aims to "share information and to improve conditions for interaction among different stakeholders". • In 2016, the Government, the Association of Local Authorities (SKL) and the Regions decided to sign an agreement for a simplified business approach by developing new joint national digital solutions.
The Netherlands	<ul style="list-style-type: none"> • Intergovernmental agreements: Municipalities have committed themselves to the national policies. • Association of Dutch Municipalities developed the Digital Agenda 2020 which focusses on transparency, efficiency, one-gov approach, increased standardisation and tailor-made local services. • Coordination of preparatory work for policies happens via the Services & Information Policy Subcommittee.
Denmark	<p>Coordination activities have been taken whereby the following can serve as examples:</p> <ul style="list-style-type: none"> • In October 2016, a new Code of Conduct for customer-supplier collaboration was agreed upon by the National Council for IT Projects, DI Digital (trade organisation), Danish IT industry association, Dansk IT (IT professionals association), IT suppliers and government authorities;

	<ul style="list-style-type: none"> • Also in 2016, a Digital Strategy has been agreed upon between the central administration, the regions and the local administrations. Focus lies on public services, business attractiveness and data security & trust; • The Strategy for Digital Welfare, running from 2013-2020, focusses on welfare improvement via specific actions.
France	Cooperation with the local level is hierarchical. Local administrations have to act in line with national e-government policy.
Austria	<p>Coordination runs via:</p> <ul style="list-style-type: none"> • The Platform Digital Austria, which includes all government levels, i.e. federal administrations, regional administrations and local administrations, as well as the private sector. Its focus lies on strategic decision-making, priority setting, overall coordination and monitoring. The Platform ensures that the workload is shared among the members; • The eGovernment Working Group of the federal administration, regional administration and local administrations. It provides a common information and communication platform.
Estonia	In November 2016, the Nordic Council on Digitalisation was created. For more information on International cooperation: see Finland.
Germany	<ul style="list-style-type: none"> • The eGovernment Strategy is a collaboration of the federal administration, the state (Länder) administration and the local administration. Connected to this Strategy is the Memorandum for the National eGovernment Strategy, which aims to share initiatives among the federal administration, the state (Länder) administrations and the local administrations. • In 2013, there has also been a German Act to promote electronic government, again targeting the federal administrations, the state (Länder) administrations and the local administrations. • In 2009, the German Basic Law (Grundgesetz) was modified to ensure a focus on simplified IT bodies and decision-making processes. Also, it gave the federal administration the exclusive legal competence to develop secure linking-up networks to connect the federal administrations and the state (Länder) administrations. • Coordination happens via the IT Planning Council, bringing together the federal administration and the state (Länder) administrations. Focus lies on cross disciplined e-government projects, with attention for the following topics: interdisciplinary interoperability, security standards, steering e-government projects, planning and implementation of network infrastructure. Support to this IT Planning Council happens via the federal Ministry of the Interior.
Iceland	Coordination happens via the Information Society Taskforce, also known as the eGovernment Taskforce. It focusses on both central administration projects and local administration projects.
Latvia	Cooperation with the local level is hierarchical. Both central administration services and local administration services are grouped within one governmental webpage. This page is led by the central government.
Liechtenstein	There is no formal coordination or cooperation. Central administrations and local administrations are independent according to the legislation.

Lithuania	<ul style="list-style-type: none"> • Coordination happens via the Ministry of the Interior (Information Technology and Communication Department). • Support is provided by Infostruktura (state-owned company created in 1992 which is responsible for the creation & maintenance of state networks) and the Information Society Development Committee (which provides technical support, maintenance and development of the e-government gate portal, and organises the inter-institutional exchanges).
Luxembourg	Policy-strategy is developed by the Association of Luxembourg's cities and communes. This organisations functions as the main interlocutor for the central government. Policy support is also provided by this organisation to local administrations.
Malta	<ul style="list-style-type: none"> • Coordination from the central administration towards the local administrations is organised via the central administration's Department for Local Government. • Policy-strategy support is provided via the Local Council Electronic Policy.
Norway	<ul style="list-style-type: none"> • International cooperation: see Finland. • Digi Strategy 2017-2020 aims to put the local administrations in the centre.
Portugal	<ul style="list-style-type: none"> • Policy-strategy is developed by the Minister of the Presidency and of Administrative Modernisation, the Minister Assistant and the Secretary of State of Local Administration, the Administrative Modernisation Agency, the regional administration and the local administrations. • Implementation of the policy strategy happens via the central administrations, regional administrations and local administrations, whereby the Administrative Modernisation Agency is in charge of the overall coordination and active implementation via several initiatives. All actors are in charge of the implementation of the policy-strategy within the boundaries of their competencies.
Spain	<ul style="list-style-type: none"> • Coordination is organised via the Sectoral Committee of eGovernment, which is a technical body of cooperation between the central administration, the local administrations, and the autonomous regions. This body is, among other things, responsible for interoperability. • Support to local and regional administrations is provided via the central administration's Directorate for Information Technologies & Communications.

Source: Based on European Commission (2017a)

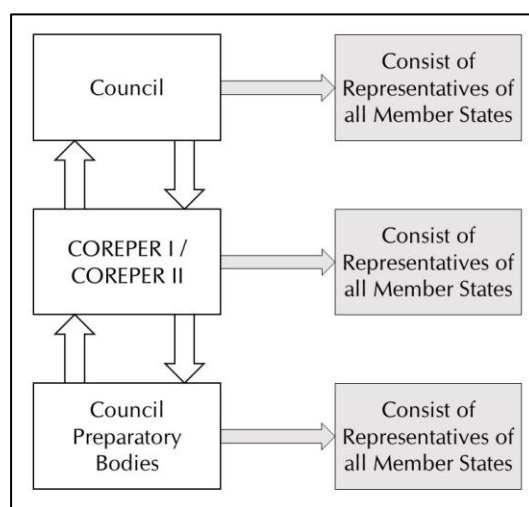
Other countries, which have centralised state structures, also apply a combination of hierarchy and network related instruments. Some countries also include the use of market related instruments. Some countries have no formal coordination. France and Latvia for example, have a stronger hierarchical focus than other countries. Lithuania, on the other hand, has a long-standing tradition for the inclusion of a market related instrument (i.e. a state-owned company that ensures the development of IT solutions was already created in 1992). Other countries, such as The Netherlands, Sweden, Finland, and Norway have opted for the application of network instruments, such as coordination bodies, consultation committees and commonly agreed strategies.

A final interesting point that can be deduced from the European Commission's eGovernment Benchmarking is the fact that the specificities of a specific state structure do not seem to impact its position in the ranking. Indeed, Germany, Spain and Belgium all score high on the eGovernment Benchmarking exercise. What seems however to be a constant factor is the application of network instruments. This should not come as a surprise. The application of network instruments requires more time, but will also lead to an understanding among the different involved actors that is more widely accepted by the involved actors. Hierarchy, as applied by Germany, can in this situation ensure that an agreement can be reached and that the agreed decision is also implemented.

DEVELOPMENT OF A BELGIAN EU-STYLE COLLABORATION

Besides the international comparison, a study on the functioning of the EU was also deemed useful to understand the potential coordination within the Belgian federal administration. The way in which EU Member States collaborate is deemed relevant for the way in which the different Belgian public administration can coordinate their work. The different EU Member States are, for a number of policy domains, still independent but agreed to coordinate their policies as they see the added value in the short, middle and long term. In order to do this, the Council of Ministers, which assembles the different Member States of the EU has been created. Depending on the policy area, Member States either have an equal vote, or a vote depending on the number of citizens they represent, or need to agree via unanimity (European Council - Council of the European Union, 2020b, 2020a; European Union, 2020).

Figure 6: Functioning of the EU Council of Ministers



Source: Based on European Council - Council of the European Union (2020a)

The interesting aspect about the structure of the Council of Ministers is that a hierarchical equality is installed among the different Member States. As Figure 6 shows, there is a constant interaction between the Council of Ministers, the level of the Ambassadors – i.e. COREPER I and COREPER II –, and the Council Preparatory Bodies – i.e. (ad hoc) Committees and Working Parties. All consist of representatives of all Member States. This approach allows for a direct interaction between all EU Member States from the most technical to the most strategic level, which can in turn guarantee a constant interaction and decision-making among the different Member States. The Belgian federal state structure is, in this respect, highly similar. All federal entities are equal, and a similar approach can be applied at the Belgian level. It is purely network-based approach that does not involve any hierarchical instruments – at least not for those policy areas where unanimity is required.

FOCUS GROUPS

During the focus groups, and as described in WP3 Requirements, it became clear that, for various participants, there is a need to install a hierarchical relationship in the Belgian federal state structure: “The fact that the regions, language communities and the federal level are all equal is seen as a problematic aspect blocking further cooperation between the administrations. Therefore, it was proposed that, for some policy aspects where the national interest dominates the regional interest, it should be possible for the federal administration and government to intervene. Examples such as Germany and Switzerland were named by the participants. Furthermore, it was emphasised that the ongoing regionalisation of policy domains creates more and more complexity as one federal organisation is split in three to four administrations and still requires an exchange of information between them” (Chantillon, Simonofski, et al., 2018). However, given the Belgian federal constitution, the installation of a hierarchical relationship is not possible and the enablers take this limitation into account.

INCREASED INFORMATION SHARING

The researchers also studied the specific topic of information sharing. To gain a deeper understanding of how the information sharing activities are organised in the Belgian context, and in particular at the federal level, a documents' analysis was executed. The focus of the study was put on the effect of the EU on the information sharing within the Belgian context. The information sharing itself, among other via service integrators, is already well-known – see Chantillon et al. (2017), Chantillon et al. (2018) and Wouters & Crompvoets (2020) among others. However, the effect of the European Union on the Belgian federal administration is largely neglected. Accordingly, the documents listed in Table 7 have been analysed. The detailed results of this study have been described in Chantillon, Simonosfki, et al. (2020). Overall, the results of the study show that the Belgian federal administration was already actively working on information sharing since the 1980's and 1990's, and further intensified this in the 21st century. The actions taken by the European Union to stimulate information sharing within and across public administrations have, however, clearly impacted the Belgian federal administration. The EU actions have been a necessary factor to stimulate the Belgian federal administration to go further in its policy. This shows how important the EU actions have been, and it is expected that the EU influence has not only been present in the area of information sharing, but also in other specific e-government domains, such as the Belgian Open data policies. As such, the EU, and more particularly the actions taken by the EU, are an important enabler for the achievement of specific requirements. In this case, it was an important enabler for a stronger information sharing within and among public administrations.

Table 7: Overview of Analysed Documents

Belgian federal administration – Analysed documents	
De Croo, 2014	Federal Parliament 2012
De Croo 2015	Brussels Regional Parliament 2014
De Croo 2016	Flemish Parliament 2012
De Croo 2017	Walloon Region and French Language Community 2013
De Croo 2018	Federal State et al. 2001
FOD Beleid en Ondersteuning 2019	Federal State et al. 2006
National Parliament 1983	Federal State, Regions, and Language Communities 2013
National Parliament 1990	Federal Parliament 2014
Federal Parliament 2003	Belgisch Staatsblad - Moniteur belge 2019
Federal Parliament 2008	
European Union administrations – Analysed documents	
European Parliament and Council 1995	European Parliament and Council 2015
Ministers from the Member States of the European Union, Ministers of countries of the European Free Trade Association, and Ministers of countries of Central and Eastern Europe and Cyprus 1997	Publications Office 2019
European Commission 2004	Ministers in charge of eGovernment policy and coordination from 32 countries of the European Union and the European Free Trade Area 2017

Council 1995	Ministers of EU Member States et al. 2005
European Parliament and Council 1999b	Ministers of EU Member States et al. 2007
European Parliament and Council 1999a	Ministers of EU Member States and Ministers of the European Free Trade Area 2009
European Parliament and Council 2002a	Ministers of EU Member States and Ministers of the European Economic Area 2010
European Parliament and Council 2002b	European Commission 2010
European Parliament and Council 2004	European Commission 2016
European Parliament and Council 2009	European Commission 2017

Source: Personal Research

INTEROPERABILITY

The researchers also studied the specific topic of interoperability. In order to have a clear understanding of what the concept of interoperability refers to, the following definition is used for the purpose of this research: “the ability of organisations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between these organisations, through the business processes they support, by means of the exchange of data between their ICT systems” (European Commission, 2017d). This definition has been chosen as it is a practical definition coming from the European Interoperability Framework, a framework that is supporting the development of interoperability in the EU Member States. This definition is, as such, useful for the FLEXPUB project, which focuses on the Belgian federal administration. Within the Belgian context, various steps have already been taken to increase the overall interoperability. The most well-known examples, from an organisational perspective, is ICEG, which is “a cooperation agreement between the federal, regional and language community governments for the harmonisation and alignment of initiatives aiming for the realisation of an integrated e-government” (author’s translation), on the one hand, and Belgif, the Belgian Interoperability Framework (FOD BOSA, 2020; FOD BOSA DG DTO, 2018) on the other hand. Via the Belgif website, an overview of the various actions and activities taken by the partners can be found.

At the European level, strong practically oriented research has been conducted on the topic of interoperability, leading to the development of an entire European Interoperability Framework, together with a number of practical recommendations for the users – i.e. the Member States. Although the European Interoperability Framework is developed specifically for the European Union level, it is highly useful for the Member States. The European Interoperability Framework is presented below. However, we decided to abstain from discussing the specific recommendations as they are cross-cutting throughout the COBIT-enablers and this could lead to confusion for the reader. It is nevertheless strongly recommended to take a specific look at the most recent European Interoperability Framework, and in particular the recommendations made therein.³⁵

The European Interoperability Framework Conceptual Model consists of four horizontal layers, i.e. legal interoperability, organisational interoperability, semantic interoperability and technical interoperability, and one vertical layer, the integrated public service governance. The different layers are defined as follows in the EIF:

- **Legal interoperability** “is about ensuring that organisations operating under different legal frameworks, policies and strategies are able to work together. This might require that legislation does not block the establishment of European public services within and between Member States and that there are clear agreements about how to deal with differences in legislation across borders, including the option of putting in place new legislation” (European Commission, 2017d).
- **Organisational interoperability** “refers to the way in which public administrations align their business

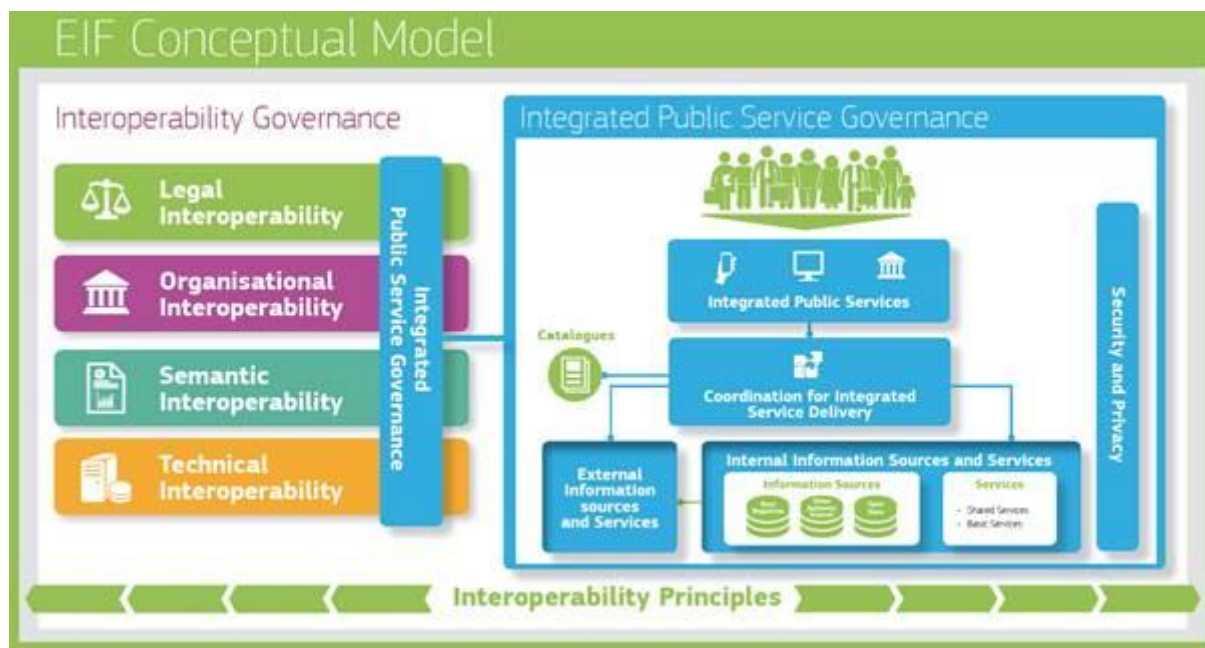
³⁵ More information can be found at https://ec.europa.eu/isa2/sites/isa/files/eif_brochure_final.pdf.

processes, responsibilities and expectations to achieve commonly agreed and mutually beneficial goals. In practice, organisational interoperability means documenting and integrating or aligning business processes and relevant information exchanged. Organisational interoperability also aims to meet the requirements of the user community by making services available, easily identifiable, accessible and user-focused” (European Commission, 2017d).

- **Semantic interoperability** “ensures that the precise format and meaning of exchanged data and information is preserved and understood throughout exchanges between parties, in other words ‘what is sent is what is understood’” (European Commission, 2017d).
- **Technical interoperability** “covers the applications and infrastructures linking systems and services. Aspects of technical interoperability include interface specifications, interconnection services, data integration services, data presentation and exchange, and secure communication protocols” (European Commission, 2017d).
- **Integrated public service governance** refers to the need for coordination and governance among the different participating organisations in offering a service. It is summarised by the European Commission as follows: “[the] coordination function ensures that needs are identified and appropriate services are invoked and orchestrated to provide a European public service. This function should select the appropriate sources and services and integrate them. Coordination can be automated or manual” (European Commission, 2017d).

As can be seen in Figure 7, the European Interoperability Framework Conceptual Model is underpinned by a number of principles that need to be followed, when applying the five layers of interoperability.

Figure 7: European Interoperability Framework Conceptual Model



Source: Europees Commissie (2017)

The continuation of the ongoing work on interoperability, within the federal administration and in collaboration with the other Belgian administrations, can support the achievements of the identified requirements, not only for this enabler, but also for the other COBIT-enablers. Indeed, legal interoperability and technical interoperability are also relevant for the Organisational Structures enabler, especially regarding the integrated public service governance. However, the other COBIT enablers can also benefit from the recommendations of the European Commission pertaining to semantic and technical interoperability.

6. CULTURE, ETHICS AND BEHAVIOUR

REQUIREMENTS

CREATING A SHARED CULTURE

It was underlined that the federal organisations are among the oldest and biggest organisations of the country. They all have their own legacy, with specific ways of working and specific cultural aspects. This makes it highly complex to change the culture, the ethics or the behavior of the civil servants working in those organisations. Furthermore, there is a lack of common federal culture³⁶. Overall, civil servants do not, according to the respondents, share a common 'federal culture'. Rather, they feel connected to and part of their specific federal organisation. This should not come as a surprise, as federal civil servants often work within their own organisation without having strong connections to other organisations, leading to a closer connection to their own organisation than to the broader federal administration. If one focusses mainly on its own organisation, then it becomes more difficult to feel part of the broader federal administration. This might however lead to less action taken to be involved in cross-organisational activities. This factor can thus lead to an intensification of a possibly already existing silo culture.

REQUIREMENTS AT THE ORGANISATIONAL LEVEL

Regarding the organisational level, the team has been able to draw a number of conclusions on the requirements. First of all, the participants underlined that, although almost all federal organisations have a vision on their functioning and task, there is a need to ensure that the staff feels part of the vision and vice versa. Also, not all staff members have sufficient knowledge and expertise to work with the digital tools that are required in the execution of the various tasks of the organisation. As a digital culture is not self-standing, it is important to ensure that an all-encompassing view on cultural change is developed or is, at least, kept in mind.

MOTIVATION AND RESPONSIBILITY OF CIVIL SERVANTS

Both for the organisational and project level, it became clear that it is necessary to find a balance between, on the one hand, the need to ensure sufficient ownership and involvement in the creation of a common vision, a new e-service, the redrawing of procedures, new ways of working etc. It is not always easy for organisations to ensure that their civil servants feel closely connected to the overall tasks and duties of the organisation. At the same time, it was also underlined that civil servants have a certain responsibility towards their organisation and sometimes need to take a more proactive position within their team, department or organisation. For example, when a new approach is launched by the organisation to involve the staff more, then it is important that civil servants take the responsibility to participate in it.

This is of course connected to the role of the top and middle management, as it is their task to provide guidance and show leadership, while involving their staff. In this way, by developing a two-sided approach in which both top and middle management, as well the rest of the staff, is involved, a higher involvement and motivation can be created, possibly leading to an increase of the so-called 'job pride'.

RESISTANCE TO CHANGE

In line with what the team already noticed before, the participants underlined that there is resistance to change within the administration. However, the degree to which this resistance is present varies, and influences the introduction of changes in the administration. Indeed, actions and activities can be taken to ensure that this level of resistance decreases.

PROJECT CULTURE

When developing a new project, it is important, according to the participants, to develop not only the technical and organisational approach, but also a cultural approach. This cultural approach is best developed already in advance of the project, but then needs to be followed and implemented during the technical implementation of the

³⁶ It has to be underlined that this is a perception of the different respondents.

project and also after the project has been implemented. In this way, the civil servants are guided throughout the whole project, and the resistance to change is tackled as well. It can also create a stronger sense of involvement and responsibility, as well as more ownership. Accordingly, this requirement can be defined as the need to develop a cultural aspect for new projects.

RESEARCH QUESTIONS

In establishing the below enablers, the researchers have been guided by the following main research question and sub-question: *How can the culture and behaviour of the administrations become more oriented towards an ever-more digital working environment?*

- What explains the current position towards disruptive technologies within the federal administration?
- Which actions can be taken to ensure the uptake of those disruptive technologies?
- What are the reasons leading to the silo culture that exists within the organisations of the federal administration?
- What actions can be taken to tackle this silo culture?

ENABLERS

As the number of identified requirements of WP3 for this enabler are manageable, it was decided to focus on all requirements. In particular, an overarching research was conducted on the importance of public values and the public values' balance. Understanding these public values is not only important at the federal strategic level, but also within the different federal organisations, at the strategy and project level. An international practice comparison has been executed to identify good practices, and also two focus groups were organised. Due to a number of practical reasons on which the researchers did not have control, only the first focus group took place and the second one was transformed into an interview (for more information, see Chantillon et al. (2018)). In this chapter, the results of the international comparison and the results of the focus groups are first discussed. The enablers for the chapter are presented in conjunction to those two research methods. Afterwards, an overarching research on the topic of public values and the public values' balance is provided. Indeed, understanding and knowing the public values of the organisation is a key enabler to ensure that the requirements for pertaining to "Culture, ethics and behaviour" can be understood.

INTERNATIONAL COMPARISON

The eGovernment Benchmark Reports of 2017 were reviewed for those countries that are labelled by the EU Commission as having a Fruitful eGovernment and an Expandable eGovernment. Countries that are labelled as having Fruitful eGovernment score medium-high to high on penetration and digitisation. Those countries are Finland, Denmark, Estonia, Sweden, The Netherlands, Lithuania, Latvia and Spain. Countries that are labelled as having Expandable eGovernment score low to medium-low on penetration, and medium-high to high on digitisation. Those countries are Austria, Germany, Portugal and Malta. Belgium is also part of this group, but is – as this research is focused on the Belgian federal administration – excluded from this exercise. Besides those countries, it was also decided to include three other countries for their geographical proximity with Belgium, namely the United Kingdom, France and Luxembourg. The United Kingdom and France are labelled as Unexploited eGovernment. This refers to medium-high to high penetration rate, and a low to medium-low digitisation. Luxembourg is labelled as Non-consolidated eGovernment, referring to a low to medium-low penetration and digitisation. Finally, it was also decided to include three countries that are not EU Member States, but that participate in the eGovernment Benchmarking exercise, i.e. Norway, Liechtenstein and Iceland. Those countries did not receive a label from the European Commission.

Table 8 provides an overview of the analysis' results for the different countries. The most remarkable finding from this international comparison is the fact that only ten out of the 18 countries provided information to the European Commission on actions they take to manage the changing working environment for the staff, or to stimulate collaboration within the public administration or within specific organisations. The results of the analysis show that

most of the actions taken by the government are related to requirements of this enabler, but the possible actions to deal with those enablers are not related to this enabler. Indeed, the suggested actions are mainly related to the enablers “Organisational Structures”, “People, Skills and Competencies”, and “Processes”. Those will not be described here as they are already discussed in the dedicated chapters for those enablers.

Table 8: Comparison of European countries

Country	Changing working environment	Stimulating collaboration
UK	Government’s “Digital Inclusion Strategy” aims to stimulate digital inclusion. Measures focus on extra budget, on “Civil Service Learning” to improve digital capabilities of civil servants, on the introduction of digital weeks and evenings, on digital ambassadors and on “Digital Friends” initiatives.	No specific information provided.
Finland	No specific information provided.	A number of coordination boards and committees were created, as well as a number of specific e-services such as a single citizen service portal that includes an overview of e-services and forms, services by topic, state and municipality services, newsroom, citizen's account, service map, and a workspace. A service portal for citizens, which functions as a single point of access to all available information and services, is currently also under construction.
Sweden	The National Procurement Services, i.e. the national central purchasing body for the country’s public sector, prepared a new approach for the acquisition of software and ICT services. Only open standards and open source frameworks shall be mandated.	Focus on jointly developing common e-services as well as developing better technical and legal rules and regulations.
The Netherlands	No specific information provided.	Cooperation via the GDI infrastructure, which includes four clusters: service delivery, authentication, data and interconnectivity.
Denmark	No specific information provided.	No specific information provided.
France	No specific information provided.	Two specific actions: (1) merging of the state IT shop DISIC with the “Secrétariat général pour la modernisation de l'action publique” into the “Direction interministérielle du numérique et du système d'information et de communication”; and (2) creation of the Digital Agency to implement a high speed internet plan and manage stakeholders’ groups.
Austria	No specific information provided.	Importance of “Platform Digital Austria” to stimulate collaboration.

Estonia	Political support for increased digital literacy, establishment of the Estonia Information Technology Foundation for Education (non-profit organisation founded by the Republic of Estonia, the University of Tartu, the Tallinn University of Technology, Eesti Telekom and the Estonian Association of Information Technology & Telecommunications, which aims to ensure enough digital skills), and establishment of the eGovernance Academy (non-profit organisation, aiming to promote the use of ICT in government services & democracy).	No specific information provided.
Germany	No specific information provided.	No specific information provided.
Iceland	ePower Expansion Policy aims to stimulate the creation of, connection of, and participation in e-services. The focus lies, among other things, on knowledge development, also for state and municipal personnel.	No specific information provided.
Latvia	Focus on development and organisation of seminars for customer service specialists to explain what types of e-services are currently available.	Redefined organisational model of public ICT management to reframe public ICT strategies, principles and scenarios, and to ensure that there is strategic coordination of public ICT development and maintenance through partly centralised management. Competencies and responsibilities in ICT management will be shared between the national and sector levels.
Liechtenstein	No specific information provided.	No specific information provided.
Lithuania	No specific information provided.	No specific information provided.
Luxembourg	No specific information provided.	No specific information provided.
Malta	No specific information provided.	No specific information provided.
Norway	No specific information provided.	No specific information provided.
Portugal	Implementation of the Simplex Programme that aims to: (1) promote innovation in the public sector via the creation of an innovative project incubator, the establishment of an award systems for civil servants, the creation of competence centres to provide technical support and a drop-your-idea platform for citizens; (2) extend e-government principles to all public sector organisations, with a focus on the creation of a one-stop shop, the opening of public data, the evaluation of users satisfaction, and the implementation of the only-once principle; and (3) relaunch a private sector program and LABX (Experimentation	Implementation of the Simplex Programme via the CTIC (Council for Information and Communication Technologies in Public Administration).

	Laboratory of the Public Administration that aims to increase efficiency and user-centric principles).	
Spain	No specific information provided.	No specific information provided.

Source: Personal Research

FOCUS GROUPS

On the basis of the focus group and the interview, a number of enablers were presented to the researchers on how to deal with the identified requirements. Those enablers can also help to tackle the identified requirements that were researched in the international practice comparison, i.e. dealing with a changing working environment and stimulating collaboration. The first enabler focuses on the development of a common federal vision (and as such the establishment of a federal culture), the second one relates to the inclusion of staff in the development of the organisational vision, and the final enabler is focused on the acquisition of digital skills.

DEVELOPING A FEDERAL VISION

A first requirement is the development of a common shared vision on the federal administration, so that the civil servants can subscribe to this federal vision, and that a common culture can be established. The Belgian federal administration already has a strategy, i.e. Digital Belgium, but a digital public administration is only one part of it and it remains unclear how the five priorities that are part of the digital government objective will be achieved. Moreover, the role of the different federal organisations in this strategy has not been developed. Therefore, it is important that the various federal organisations define together what their vision and strategy is for the digital public administration. This enabler is strongly aligned with the COBIT-enabler "Organisational Structures". Indeed, it will be necessary for the FPS BOSA to define together with the different federal organisations what this vision and strategy will be. In order to ensure that it is widely approved and known, a political approval of this vision and strategy will also be a requirement.

DEVELOP AN INCLUSIVE ORGANISATIONAL VISION DEVELOPMENT PROCESS

Secondly, it was underlined by the participants that the federal organisations should develop an internal vision and strategy. It was suggested to increase the participation level of staff in the preparation of the organisational vision, thereby respecting the position of the top management. This should not focus on providing input for the vision, but rather on explaining why certain decisions related to the vision are taken. Furthermore – and it has to be recognised that this is a difficult step for the administrations due to budget and staff resource limitations –, it is necessary to ensure that the vision is also translated in the individual task agreements and evaluations that exist with each staff member. Of course, the deeper one goes in the organisation, the more difficult it becomes to translate this vision into concrete actions for the staff member. This is one of the key limitations in finding a balance between the need of the individual staff member to be involved and the broader organisational policy approach that is taken.

DIGITAL CULTURE DEVELOPMENT PLAN

A final enabler, besides involving staff members in the vision of the organisation, is the setting up of an digital culture development plan that can also help other organisations to deal with culture, and specifically culture change. It can include actions to be taken regarding the behaviour of staff members, as not all of them have the required digital skills (see also the below enabler "People, skills and competencies"). It is also possible to include, in such an digital culture development plan, a section on the inclusion of staff members lacking the necessary digital skills via a number of specific actions, such as buddy approaches, online basic courses, printed manuals etc.

Of course, there also has to be attention for other staff members who wish to broaden their digital competencies or who wish to undertake innovative actions. However, as a digital culture is not self-standing, it is important to ensure that an all-encompassing view on cultural change is developed or is, at least, kept in mind. Accordingly, the development of a concrete change management approach at organisational level is required, as well as guidelines

from a horizontal and/or central body.

UNDERSTANDING THE PUBLIC VALUES' BALANCE

Besides the international practice comparison and the focus groups, in depth research was conducted on the role of public values in an organisation. Public values can be defined as 'concepts, distinctive of an individual or characteristic of a group, of the desirable which influences the public services offered by the public administration' (Chantillon, Cromptvoets, et al., 2020; Kluckhohn, 1951). Public values and e-government policies are strongly related, and a change of the public values can be expected as a consequence of the e-government policies. This can also impact the relation between the staff of an organisation and the public values that are followed in the e-government policy of an organisation. As such, it can have an impact on the enabler "Culture, Ethics and Behaviour", and the topic was therefore also studied. In particular, three research activities were conducted.

First, a systematic literature review was executed to gain a deeper understanding of the current status of the academic literature concerning the topic of public values. Second, a documents' analysis was executed, whereby the focus was put on the importance of public values in strategic e-government policy documents. Third, four case studies were conducted via interviews to understand the role of public values in e-government projects. As such, three areas were covered, the academic literature, the strategic level within a public administration and the project level within an administration. The results demonstrate that understanding the public values of individuals, teams, departments and organisations is of high importance to align the different approaches that are followed. Therefore, it can be argued that understanding the public values is an important enabler to deal with the above-mentioned requirements. In what follows, the results of the systematic literature review are presented, as well as the results of the documents' analysis at strategic level and the case study research at project level.

SYSTEMATIC LITERATURE REVIEW

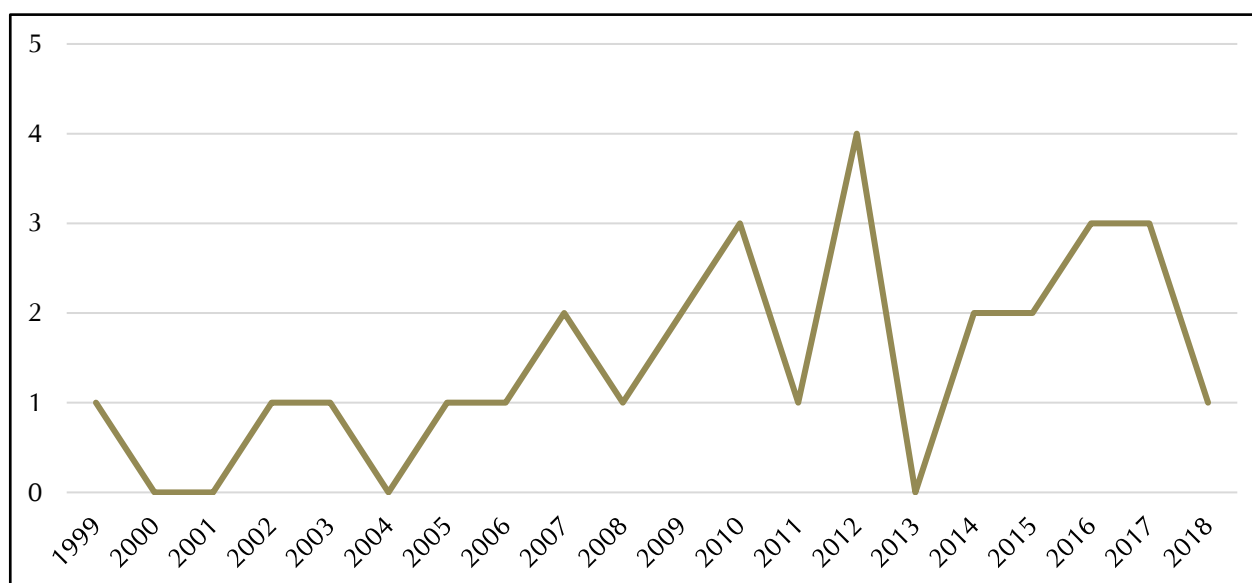
METHODOLOGY

It was decided to conduct a systematic literature review as it helps to generate a picture on the current status of the research field (Petticrew & Roberts, 2007). A two-step approach was used for the review. Step 1 included the selection of relevant concepts. A number of concepts which are related to 'public sector values' / 'public values' and 'e-government' / 'e-service' have been selected. Based on this, different concept groups have been created for the search. The language was set for English, without a specific time range or document focus. The end year was set at 2018. As the research was executed in 2019, there was a potential for the inclusion of incomplete data for 2019. Therefore, 2019 was left out and the final year set was 2018. The search was executed in three databases, i.e. Web of Science, JSTOR and LIMO (search engine of the KU Leuven). A total number of 53 documents has been retrieved from this search. Step 2 focused on the qualitative analysis of the documents. All documents were analysed and the main criteria for inclusion in the final set of selected articles was the existence of a relation between the two poles of concepts, i.e. 'public sector values' / 'public values' and 'e-government' / 'e-service(s)'. 29 articles were included in the final selection. The results are discussed below. One of the main shortcomings of this review is the fact that the literature review is only based on three databases, therefore, it is indeed possible that some articles are missing. However, it should be underlined that this remains a relatively unknown topic. Those three databases are widely used and can be seen as referential databases to conduct research on.

RESULTS

The search delivered only 53 papers from the three databases that were searched. After a first selection round in which the existence of a relation between the two poles of concepts was analysed, it was decided to keep only 29 papers in the final selection. The papers can be divided as follows: 23 peer-reviewed journal articles, four conference papers, one book chapter and one opinion. Figure 8 provides an overview of the publications per year, what is clear is the increase until 2012, and a fall back afterwards.

Figure 8: Publications per Year



Source: Chantillon, Cromptvoets, & Peristeras (2018)

What is clear from the papers is the limited overall attention for the meaning of the concepts ‘public value’ and ‘public values’. 22 out of the 29 papers do not provide any description on the meaning of the concepts or a discussion on the difference between them, and presume that they are clear for the reader. Bozeman (2009) argues in this respect that there is no need for a universal description on the meaning of the concept, but what is however relevant is at least a description of what the authors themselves mean with the concept (Bozeman, 2009, pp. 370-371; Sundberg, 2016, pp. 147-148). Moreover, the relation between ‘public values’ (plural) and ‘public value’ (singular) is not clarified, except for the papers of Karkin & Janssen (2014), Bannister & Connolly (2015) and Deng & Karunasena (2018), whilst this is of high importance as this can lead to conceptual confusion.

Two other findings are also interesting. Firstly, the ratio between theoretical and empirical articles is 12 to 15, and two papers use a mixed methodology. Most papers (11 out of 17) furthermore also use a qualitative methodology. Secondly, when looking at the authors, it is fascinating to see that there are only few authors who published more than one paper on the relation between e-government and public value(s), i.e. Marijn Janssen, Frank Bannister, Regina Connolly and Hepu Deng. The other authors do not appear on a regular basis – this can be worrying as it can be highly difficult for the field to develop itself and to create new insight.

Another finding is that the different articles start from the assumption that digitalisation or e-government has indeed an effect on the overall public values of the administration. It has, however, to be underlined that while most of them start from this assumption and take it as a starting point, there is no strong development of the argument that there is also an effect. Only the article of Bannister & Connolly (2014) has the explicit intention of understanding the deeper effect of the e-government developments on the public values of an administration.

Based on the above information, it can be concluded from the literature review that the relationship between e-government and public values is only weakly developed. The public values’ perspective is mainly used as starting point, but without a clear introduction or clarification of their meaning, and the authors often do not continue to use the concept in their paper or for the argument that they aim to make. Lastly, we also noticed that most authors do not really on each other’s work, and it can therefore be concluded that the overall academic attention and focus on the relation between e-government and public values is highly limited.

DOCUMENTS’ ANALYSIS – STRATEGIC LEVEL

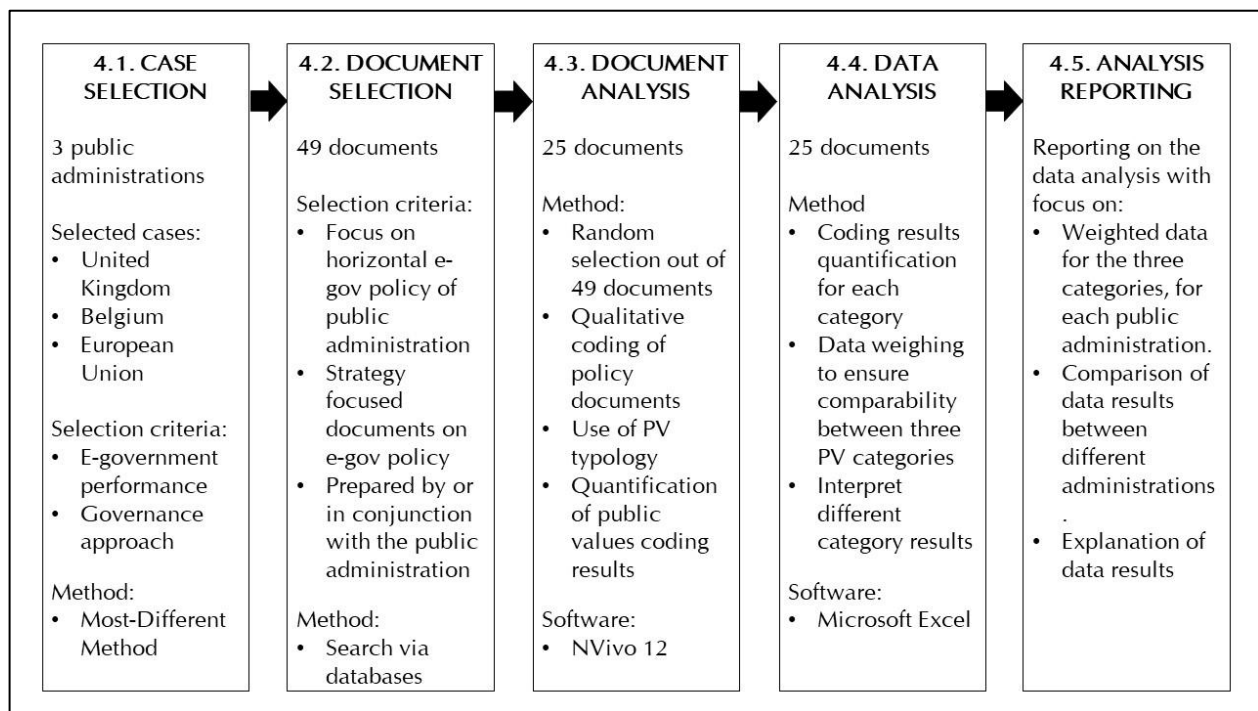
This research aimed to improve the current knowledge of the public values’ balance in e-government policies. The strategic level was targeted, as this is highly important for the future development of policies. The results of this research have been published in Chantillon et al. (2020). The text below contains a summary of the methodological

approach and of the research results. More details can be found in the publication, which is available in open access via the [KU Leuven Libraries](#).

METHODOLOGY

The methodological approach consisted, as shown in Figure 9, of five steps. The first step was the case selection, whereby three cases were selected: The United Kingdom, Belgium (federal administration) and the European Union. Secondly, the documents were selected – 49 in total. Afterwards 25 out of these 49 documents were analysed via a pre-defined and in theory grounded coding scheme consisting of three sets of public values, structured on the basis of three governance approaches – hierarchy, market and network. The fourth step consisted of the data analysis itself and finally, the data was reported in a peer-reviewed journal article.

Figure 9: Methodological approach



Source: Chantillon et al., (2020)

RESULTS

Three research questions were put forward to guide the research and were answered in the peer-reviewed journal article:

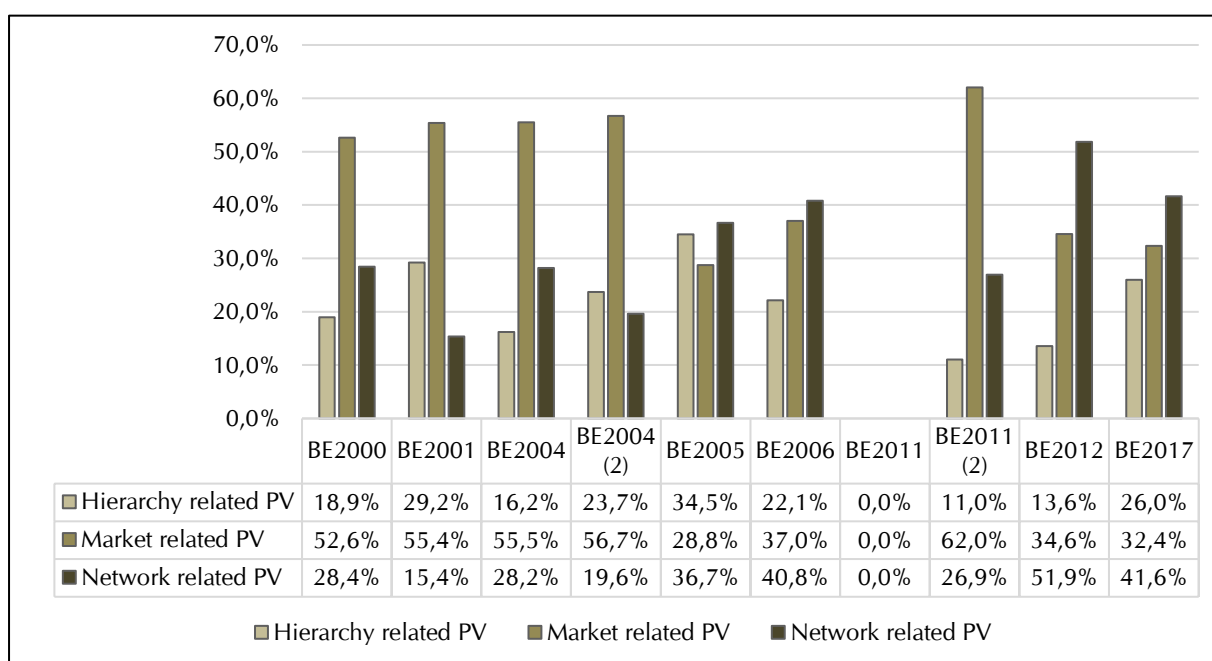
- Which public values are prioritised in the e-government policies of public administrations?
- How are the public values present in the e-government policies connected to a governance approach?
- How can public values prioritisation be explained?

Overall, the research results can be summarised via the following quote from the article: “The results show that market related public values often play a dominant role in e-government policy documents, but so do – to a lesser degree – network related public values. Hierarchy related public values are seldom dominant. At the national level, four factors explain the prioritisation: The attention for a specific governance approach at a given time, the influence of politics, the specific topic of the e-government policy document and the role of authors. Power distribution at the EU level plays a key role in defining the public values balance” (Chantillon, Crompvoets, et al., 2020).

The results for the Belgian federal administration are presented in Figure 10, whereby the following analysis can be

made: “The documents BE2000, BE2001, BE2004 and BE2004(2) show a focus on market related PV³⁷ with a result above 50%. In those documents there is no changing trend concerning hierarchy related PV or network related PV: Hierarchy related PV represent between 16% and 29% of the PV, network related PV fluctuate between 15% and 28%. More recent documents, from 2004 onwards, do not show a clear line of preference for a PV category. BE2005 is balanced and BE2006, BE2012 and BE2017 mostly emphasise network related PV, followed by market and hierarchy related PV. BE2012 is the only document in which the network related PV score is above 50%. The two documents from 2011 stand out for two reasons. The first document, BE2011, was the results of a broad political crisis at the Belgian federal level leading to a financial agreement on e-government policy without any policy orientation. As there was no text in the document related to the e-government policy to be pursued, there were as such also no PV included in the document. BE2011(2) scored 62% on market related values, which was the highest score of all analysed documents. Overall, market related PV are dominant in five documents, network related PV in four documents – but only once with more than 50% – and hierarchy related PV are never the dominant category, but are several times (BE2001, BE2004(2), BE2005) the second category present in the documents. For BE2005, the hierarchy related PV achieve almost the same percentage as the network related PV, which has the highest percentage.” (Chantillon, Cromptvoets, et al., 2020).

Figure 10: Belgian Public Administration PV distribution (Percentages)



Source: Chantillon et al. (2020)

CASE STUDY RESEARCH – PROJECT LEVEL

This case study research aimed to analyse how public values impact practitioners in their selection of development methods of e-government services. The project level was targeted, as this is highly important for the future development of policies. The results of this research have been published in Simonofski, Chantillon, Cromptvoets, Vanderose, & Snoeck (2020). The text below contains a summary of the methodological approach and of the research results. More details can be found in the publication, which is available in open access via the [KU Leuven Libraries](#).

METHODOLOGY

The following quote from the proceedings paper summarises the followed methodology: “A multi-case study

³⁷ “Public values”.

research method was taken whereby each project was analysed qualitatively thanks to two research tools (1) an in-depth interview with a key stakeholder and (2) a quantitative ranking exercise. [...] It is important to underline that within one project several user participation methods can be used. According to us, those different user participation methods can be influenced by the different public value clusters. In order to first explore this theoretical link, we chose to study the influence of values on participation methods by analysing quantitatively and qualitatively four projects. To understand the importance of public values within each project, we performed a quantitative ranking exercise where we presented the interviewees with the different values [...] [and] asked them to rank them in function of their importance they had in the project. [...] To further complete this information, we applied a qualitative approach, with a focus on in-depth interviews. This qualitative information helped us to understand the importance of public values, the user participation methods used and the relation between the two" (Simonofski et al., 2020). The studied projects can be found in Table 9.

Table 9: Analysed projects

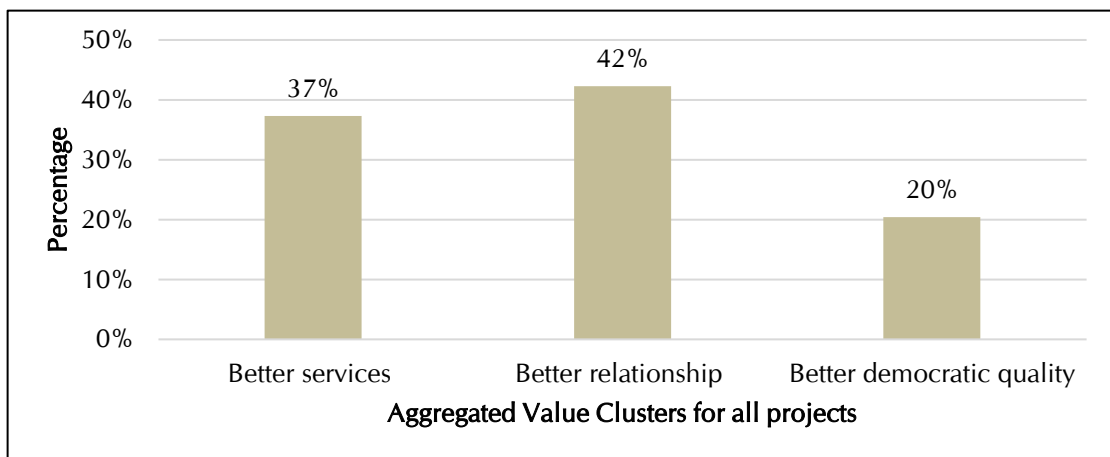
Governmental Body	Governmental Level	Date of the interview	Function of the interviewee
National Geographic Institute (Belgium)	Belgian federal level	14/12/ 2018	Project Manager
City of Namur (Belgium)	Belgian local level	09/01/2019	Head of Data Office
City of La Louvière (Belgium)	Belgian local level	19/12/2018	E-Government Project Manager
City of Linköping (Sweden)	Swedish Local level	07/12/2018	Head of Digitalisation

Source: Simonofski et al. (2020)

RESULTS

The public values can be classified in three clusters, namely better services, better relationship and better democratic quality. The results show that the achievement of a better relationship was the most important, followed immediately by better services. A better democratic quality was only of minor importance, compared to the other two public values' clusters. Also, "when looking in more detail at the balance of the public values' clusters for the four individual projects [...] then it appears immediately that there is not a single public values' cluster that receives more than 50% of the points. Secondly, the Digitalisation Linköping project is the only one in which the better services cluster is the one with the highest percentage. The three other projects all have better relationship as their main public values' cluster. For the Digitalisation Namur and the Digitalisation La Louvière projects, this cluster is however immediately followed by the better services cluster. Those two projects have, as such, a more balanced public value approach than the other projects" (Simonofski et al., 2020). This data is also presented in Figure 11.

Figure 11: Public Value Clusters



Source: Simonofski et al. (2020)

Finally, connecting those public values' clusters to specific user participation methods teaches us that these participation methods can be connected to specific public values. It is thus important for those starting to work on (or already working on) a participation project to understand that public values are important in this context. Not only will it help them to understand what type of participation methods are relevant, but it will also help them to internally – i.e. in the project – define what the public values are that need to be followed by the different project participants. If no such information is gathered, then this might lead to conflicts or a disturbed project. More detailed information about the research results can be found in Simonofski et al., (2020).

7. INFRASTRUCTURE

REQUIREMENTS

In the WP3 report, we have identified three main requirements related to the infrastructure necessary to enable innovative and flexible e-services.

- **Capability to innovate:** The adoption rate of new technologies within governments gives rise to a number of difficulties. It is slower due to fear of change, lack of incentives or administrative inertia. Furthermore, the information architecture is complex in the context of administrations. We define information architecture as the structural design of shared information environments that support government entities in their task execution. Finally, there is also a need to enhance the end-to-end thinking in the delivery of e-services. However, this end-to-end delivery and adoption of new innovative technologies is dependent on the behavior and goodwill of organisations and/or sub-entities. This collaboration is not always possible as the actor responsible for the entire process cycle might not always be capable and/or willing to ensure effective collaboration, due to forced intergovernmental collaboration, silo structures (fragmented government entities who lack covering leadership and responsibilities to transcend barriers), or competition between different entities. A negative consequence of this lack of integrative organisational architecture is the replication of services and a loss of resources.
- **Privacy:** The main requirement here is to avoid privacy violations. Privacy can be guaranteed by developing certain habits and customs such as the “privacy-by-design” approach. In such an approach, the development of applications is performed in such a way that privacy is automatically safeguarded. This requirement is already dealt with in the “Principles, policies and frameworks” enabler above.
- **User-centricity:** The last main requirement that needs to be addressed when developing the service infrastructure is the user-centricity and the need to focus on the user/citizen to give a ‘better’ experience. The main lead for solution to tackle this requirement is to integrate the user in the development. This can thus be linked to the “Processes” enabler discussed above. Indeed, participants stated that there is a need to take the User experience into account and to thus design user-friendly applications.

RESEARCH QUESTIONS

In establishing these enablers, the researchers have been guided by the following main research question and sub-question: *What is the optimal technical ecosystem to enable the delivery of public e-services?*

- How can the common acquisition and/or sharing of hardware and software among one administrative level and across administrative levels be ensured?
- How can the uptake of technical standards facilitating data exchange between administrations be ensured following a building-block and micro-services methodology?
- Which elements make a public e-service user-friendly?
- Taking into account the federal structure of Belgium, which high-level technical architecture is the most optimal to facilitate public e-service delivery?
- How will the service infrastructure of the administration be impacted by the legal obligations pertaining to cyber-security?

ENABLERS

Out of the three main requirements identified above, we have decided to focus on the “Capability to innovate”, and more specifically on the enterprise architecture to enable it, taking into account transversal security issues and having user-centricity as key feature.

In order to answer the defined research questions, we performed an international comparison of architectures in

well-established e-government countries. This comparison enables us to give recommendations for an optimal technical ecosystem for Belgium.

INTERNATIONAL COMPARISON OF ARCHITECTURES

In this section, we compare Belgium with Estonia and the Republic of Korea following three main axes: The “Service Oriented Architecture” (SOA), the Cloud Computing usage and the general IT environment & E-Government 2.0. The first axis is separated into three categories: general SOA criteria, “Enterprise Service Bus” (ESB) and Microservices. In the general SOA criteria, we look at the API type which gives information about how the services are developed to know whether they have to adapt to the architecture (REST) or the architecture has to adapt to the services (SOAP). Then, via the general SOA criteria, we look at whether the documentations about the services are available, whether the system is manageable and scalable, and finally whether the architecture is centralised. Then, we look at the ESB criteria oriented towards the deployment of an EAI-backbone, which shows whether the resources are shared between the services, whether the architecture is limited in a physical region, whether the services are available at any moment, whether all the services are all connected to a single bus and whether the architecture includes full coverage of the services usage such as security. The Microservices technology is the final criterion of the first axis and shows whether it is being used or not. We also show how big the maintenance time and the impact on the system are and if the services are separated into different machines.

The second axis is about the Cloud technology and is separated in six categories. The first category is Cloud characteristics, namely the type of Cloud architecture that is deployed; the Cloud provider and owner to see whether the country develops its own solution or not; and the first time the Cloud was introduced in the country. The second category is about the reasons of using the Cloud technology with the strengths and weaknesses of such a technology in the context of the country. The third category is about Cloud Security, which covers the means set up to secure the data, the number of data centers, and whether the country benefits from external help to secure their system or not. The fourth category gives the percentages of Cloudification (services to the Cloud) and the percentage of financing capacity to see what part of the budget is dedicated to it. The fifth category is about the service models to see if a country uses SaaS, PaaS and/or IaaS. As SaaS can be accessed from a terminal, which is usually a web browser, officials and citizens can access the services from anywhere as long as they have a connection to the internet making their tasks more effective. Governments use PaaS as it offers the possibility to deploy and create their own applications on a cloud infrastructure. They have access to a development environment on which they can build and develop applications. Thanks to IaaS, the government can keep the control of critical data while making it available to the citizens and FPS. Furthermore, they can delocalise huge but non-critical data (and everything else) to decrease the maintenance costs of their data centers. The sixth category points out the possibility of growth of the Cloud technology and checks potential inhibitors. The technical inhibitor indicates if there are technologies breakthroughs that could be used, the managerial one indicates if there are inhibitors in the real-world environment (e.g. political) and finally the financial one evaluates whether money is an inhibitor for improvement.

The third axis focusses on the E-Government 2.0 giving information about the general IT environment. The different indicators are: the presence of a CIO in the country (in order to find best practices) and the percentage of internet users (in order to have an idea about the e-literacy of the population and to give an insight on the efficiency of the e-services from the government with the percentage of citizens using internet to interact with it). Other indicators are the apparition of the first portal to see when the government decided to adapt itself to new technologies and the percentage of official votes through the internet to see how far a country went in its use of e-services. We also look for the presence of a one-stop website for the citizens to see if they can easily access information and/or services and finally, if there is a portal allowing the citizen to give his/her opinion thus, allowing both the government and the citizen to interact. The latter would give a first insight on E-Government 2.0 in the different countries. The comparison table can be found below (Table 10).

Table 10: e-Government ICT Comparison Table

Category	Criterion	Estonia	Korea	Belgium
SOA	Protocol type (REST/SOAP) Communication of the applications, services and tools Manageability and scalability Centralization	REST Yes Yes	REST share-go.kr + on-Nara BPS Yes Yes	SOAP Sparse and outdated No Yes but complicated
ESB	Sharing of the resources Region Boundaries Accessible at anytime Single bus Full coverage (security, ...)	Yes (X-road) None Yes X-Road Yes	Yes (GIDC) None Yes on-Nara BPS Yes	No None Yes 6 integrators Yes
Microservices	Small and Autonomous but interactive services Maintenance time and impact Microservices on different machines	/	/	/
Cloud characteristics	Cloud Infrastructure Deployment Cloud provider Cloud Owner First time introduced in the country?	Private/ Public Amazon, Microsoft, Google +13 others Estonian Government Cloud 2013	Private+community NRIS NRIS 2013	Hybrid Gcloud/Microsoft Gcloud 2013
Reasons of using cloud	Cloud Strengths Cloud Weakness	Gain speed, scale, and economic benefits Security	Restructure the datacenters Time to migrate	economic benefits and synergy Security
Cloud Security	Means set up to secure the data Number of data centers External help?	Cyber security MoU 10 colocation data centers Microsoft/OpenNode/Ericsen/Cybernetic/	9-layer security + 5-type analysis 3+1 back up	>30 Smals
Ratios	Cloudification percentage Percentage of financing capacity	99% 60%	76% (over intended) 40%	15%
Service Models	SaaS Paas IaaS	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Barriers	Technical Managerial Financial	No No No	No No No	No Yes Yes
IT environment & e-government 2.0	Presence of a CIO Number of internet users Citizens using internet to interact with the government Apparition of the first portal online Official vote through the internet One-stop website for the citizens Citizen's Opinion Portal	Yes 88% 81% 2003 30,50% Yes Osale.ee	Yes 89,65% 2002 0 Yes Minwon24	Yes 81% 52% 2002 0 Yes but light No

Source: Personal Research

TECHNICAL ECOSYSTEM SUGGESTION FOR BELGIUM

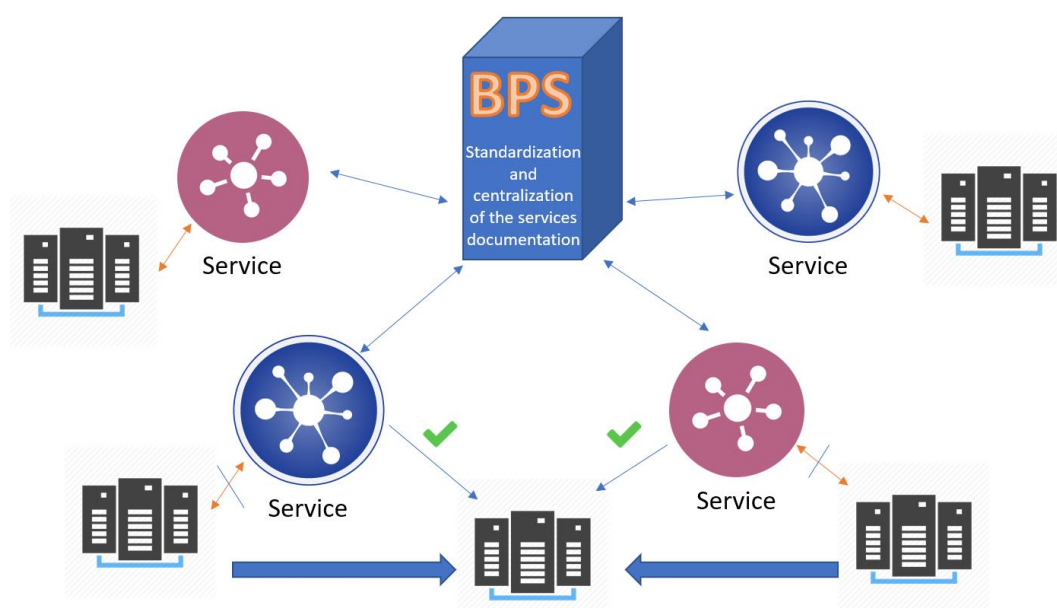
We developed a 3-layer proposition for an optimal technical ecosystem in Belgium. Our propositions for the Belgian case are based on a technological and a best-practice level. The First stage concerns the harmonisation of the ICT environment, as it is one of the biggest challenges of the country. Then, the second stage is about Digitalisation in order to enable the citizen to tender legal document through the web. Finally, the third stage is about the participation of the citizen, to allow interaction with the government and citizen-based solution.

LAYER 1: HARMONISATION

While doing our research, we noticed that the ICT environment of Belgium was sparse and that there was no clear and complete documentation about the different services. Furthermore, there is no standard service architecture as every solution directly emanated from the services with a need for IT tools. This layer is an adaptation to the Belgian case of a mix made from the first three stages of Layne and Lee (Layne & Lee, 2001). The purpose of this layer is to harmonise the Belgian ICT environment in order to increase the manageability of the different services. It is composed of four different blocks (as shown in Figure 12 below): Information about the Belgian ICT; Standardisation of the documentation; Centralisation of the documentation; and Fusion of bottom-node data centers.

1. Information about how the government works (IT view, where does my data go?): The first and most important step would be to make available all the information about the interaction between the services in order to be sure that any developer, employee or citizen has the possibility to learn how the whole system works. The possible direct return on this would be the innovation of the solution proposition, which could possibly come from new sources (citizen-based ideas, etc.).
2. Standardisation of the Documentation: The standardisation of the documentation of the different services, applications and tools in order to clear the whole SOA environment will allow the employees to understand more easily the documentations of the different services that he/she has to work with. It will also help to prepare the environment for further upgrades.
3. Centralisation of the Documentation: The biggest problem when the services interact with each other is that they have no centralised and up-to-date information about the other services. So, when a service is created or updated, it might have an effect on the other services that need to interact with it. The solution is to create a Business Process System (BPS) similar to the Korean on-Nara BPS in order to allow every service to read/upload/modify documentation about the different processes of the government (e-)services. This BPS will be a necessary online stop while creating/updating new services. This will allow to keep an accessible and updated documentation of all the different (e-)services. The reason why we chose to centralise the documentation using a BPS is multiple. First, there is no such centralisation procedure to achieve transparency of the services in Belgium. Then, the Koreans define the BPS as a system gathering every piece of information about the business processes of any services and e-services and that is what we wanted for Belgium for reasons explained above. Finally, it is more about the reshaping of a part of the current Information System but calling it a BPS, in relation with its Korean inspiration, is a way to refine the idea behind it.
4. Fusion of bottom-node Data Centres: In Belgium, there are many Data Centres inducing useless multiplied maintenance costs and security concerns. Therefore, to reduce the costs, data centres on bottom-nodes only used by smaller instances of the government should regroup in small groups inside bigger-instances of the same competencies. This gathering will require the use of standardised documentation in order to allow every instance to still be able to act on the data, thus preparing the Cloudification of the different services.

Figure 12: Illustration of the Harmonisation layer



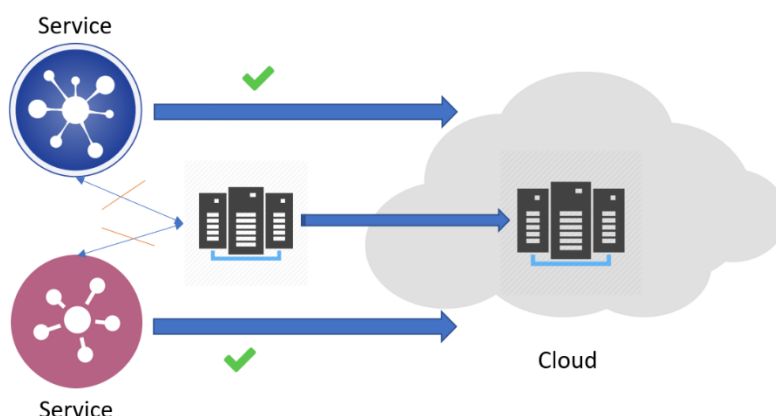
Source: Personal Research

LAYER 2: DIGITALISATION

The second layer, composed of three blocks, is about the Digitalisation of the different services and it is linked to the last layer of Layne and Lee. In the first layer, the idea was to harmonise the overall environment of the Belgian ICT. In the second layer, we can use this standardisation to go even further by developing REST API in the first block and Cloudifying the different services to increase the scalability and manageability of the Belgian ICT environment in the second block. The third block will be about the digitalisation of the legal forms, which are common to the whole country.

1. **Development of REST API:** After documenting and standardising the different services, applications, tools and their documentation, and uploading it on the centralised BPS, we can go further to facilitate even more the apparition of new services in the system by upgrading the architecture to a REST architecture. Such an architecture will allow the introduction of new services without any need to make a deep analysis of the documentation as REST APIs are standardised. Thus, it will allow the faster deployment of new services.
2. **Cloudification of the services and the data** as shown in Figure 13: This will allow the e-services to be used by any authorised party around the world, facilitating the reutilisation of the already-developed e-services. Furthermore, as the different bottom-node data centres are being fused and documented, there is only a step to make in order to fully Cloudify the different services. It includes the upload of the documentation using the BPS so that any service can access the information from anywhere.
3. **Clear and complete one-stop shopping for citizen:** The current website of official information offers a lot of information about the different processes in the different matters such as taxes, work or education but there are no legal forms, which are managed by smaller instances than the federal level. Those different forms are defined by the different administrations and should be standardised in order to better serve the citizens. The federal government should create canvases that administrations will reuse while making it available through the web to have the possibility to tender official documents online when those only need citizen-based information. Such a standardisation limits the need of the citizens to physically go to its local administration.

Figure 13: Cloudification of the datacenters



Source: Personal Research

LAYER 3: PARTICIPATION

This third and last layer is about the participation of the citizens in the government's life. It is linked with the last stage of (Soon Ae et al., 2010). Thus, it is the first steps into the world of E-Government 2.0. We chose to decompose this layer in three blocks. First, we observed that, on a technological level, E-Government leaders weren't using Microservices. Yet, Microservices could turn Belgium into an E-Government world leader while pushing the scalability and manageability of the Belgian services further. The second block is about the optimisation of the Cloud infrastructure and it aims to empower even more the Belgian ICT. The third and last block is about the citizen's participation and interaction with the government.

1. **Microservices development:** This is the logical next step of standardising, Cloudifying and documenting the e-services. The creation of a toolbox, with not only complete solutions at disposal but also pieces of solutions, will drastically decrease the need to fully develop new solutions. The toolbox will rely on the Microservices principle we described in our literature review. The Microservices will be at disposal of any federal authority or authorised party in order to quickly develop and deploy new solutions. Such a toolbox could make the Belgian government a leader in the development of E-Government.
2. **Optimisation of the Cloud infrastructure:** After the Cloudification and documentation of the different services and their datacentres, an optimisation calculation can be done while respecting the legal texts, in order to find an optimal configuration. This will reduce the cost while increasing the efficiency of the overall Belgian ICT as the resources will be optimal.
3. **Interaction and online voting:** Using the standardised back-end tools, the development of a front-end tool for the citizen is facilitated. This platform will enable constructive debates about decisions using complete information in order to add value to the decision or to the solution itself by modifying it. Such a platform could be used to ask the opinion of the citizens while taking decision. It will allow them to vote online for what they think is the fittest for the country.

8. PEOPLE, SKILLS AND COMPETENCES

REQUIREMENTS

DIGITAL DIVIDE AMONG CITIZENS

This requirement relates to the necessity for administrations to cope with the digital divide among citizens. More precisely, they should be aware that if a large part of the population awaits from them to be innovative and to follow the wave of the new technologies, some citizens prefer to function the “old way” and to have personal contacts via visits to the administration. The paradigm of “digital-by-default” is a nice slogan, but it should be ensured that citizens and businesses keep the opportunity to access services offered by the administrations through other channels as well. Nobody should be “left on the side of the road” as a consequence of an “all and only digital” strategy.³⁸ It is, however, known that administrations try to increase the use of their e-services by citizens and businesses by facilitating the access to e-services, by increasing the complexity of non-digital services or by decreasing the challenges for a digital demand. An example of such an action is the online tax form offered by the FPS Finance. Part of the form is already prefilled in the online form, delivers extra online services such as optimisation and a provisional calculation of the tax assessment and can be handed in later, whereas the offline tax form remains highly complex to use and must be handed in one month earlier.

Furthermore, the team found out that the digital divide is not only a material problem pointing to users that are unable to use digital tools. There is a group of citizens which are able to use digital tools, such as social media, e-commerce and online banking, but which do not use the digital options provided by the administrations. This problem is also acknowledged by the European Commission in its Annual eGovernment Benchmarking Reports as one of the main challenges for the Belgian administrations. Belgium is a country where there is, on average, a high level of education and economic wealth, but the use of public e-services remains overall rather low.

PUBLIC SECTOR ATTRACTIVENESS

It is complicated for the public sector to compete with the private sector when it comes to attracting specific strongly demanded profiles, such as IT specialists. Indeed, the public sector is rarely able to offer as interesting “extra-legal advantages” as the private sector and seems to suffer from a negative image: the impression exists that there are not enough innovative projects to work on compared to the private sector. This can lead to unfortunate situations where administrations are unable to roll out their e-service projects, due to a lack of sufficiently skilled personnel. In essence, this comes from the fact that administrations have difficulties to attract specific profiles, but also from the fact that they have difficulties in retaining specific profiles once they have managed to attract them.

DIFFICULTY TO ATTRACT SPECIFIC PROFILES

As confirmed by the interviews and the focus group, administrations have difficulties recruiting specific IT profiles, but also other specific profiles, such as technical profiles (bachelor in construction, electro mechanic, electronic, controllers, drawers), medical profiles (doctors and nurses are extremely hard to find), paramedical profiles, financial profiles (accountants), legal profiles, economical profiles, or surveyors (géomètres/landmeters).

Nevertheless, it seems that public sector attractiveness is less of an issue when it comes to attracting young people who just finished their studies. For them, the public sector is actually quite competitive, as the salary for a starter is quite good, as there is a good work-family balance, and as they directly have the full amount of legal holidays. There are also new tendencies with young people finishing their studies. For example, they care less about having a company car, so the public sector can be competitive by offering them their public transport subscription (train, metro, bus, tram).

Despite all this, the attractiveness of the public sector remains low, and this is due to three causes, namely: 1) the lack of people who actually decide to take such a job (even if they applied for it); 2) the lack of clear political vision, which creates a lack of stability regarding the projects that the civil servants work on; and 3) the administrative

³⁸ This is recognised by both administrations and politicians at different governmental levels, including the federal level.

heaviness of the recruitment procedure and lack of flexibility. For more information on these causes, we invite the readers to consult the WP 3 report.

DIFFICULTY TO KEEP SPECIFIC PROFILES IN THE ADMINISTRATION

Not only is it difficult to attract specific profiles to come work for the public sector, but it is also extremely difficult to keep them within the administrations. Indeed, there is much more volatility today. People do not necessarily stay their whole career in an administration / the public sector. Before, people used to start a civil servant career and stay their whole life within the public sector, but this is no longer systematically the case. For instance, IT specialists do not really care about the job stability aspect of a position in the public sector, as they know that they will easily find another job. For them, the concrete function and mission that they will conduct is much more relevant.

This is due to five causes, namely: 1) the public servants' loss of purpose because of the digitalisation; 2) the effect that the "new ways of working" ("Home-working", "Flex-desk" ...), have on civil servants, who feel less personally involved in their job; 3) the lack of appropriate work environment; 4) the lack of innovative management, linked to resistance to change; and 5) the lack of clear political vision, which creates a lack of stability regarding the projects that the civil servants work on. For more information on these causes, we invite the readers to consult the WP 3 report.

LACK OF FINANCIAL RESOURCES

This requirement relates to the budgetary shortcomings that hamper the development of e-services. A clear example is the former FPS FEDICT. The organisation witnessed an overall decrease of its budget due to the budgetary shortcomings of the federal government. This led to a situation in which it became highly difficult for the FPS to innovate and develop new tools, and created a 'survival situation'. Furthermore, the Federal government wants the overall ICT budget to decrease. Although this can indeed lead to an increased level of cooperation between organisations – the G-Cloud is a clear example of this – it should be underlined that reducing the budget for ICT, on the one hand, and proclaiming the development of new ICT tools, on the other hand, is incompatible. A decrease of the budget leads to less investments, while the overall objective of increasing greater efficiency via digitalisation is expensive – especially in the first years, both because of the innovation aspect and the knowledge that projects can fail.

RESEARCH QUESTIONS

In establishing these enablers, the researchers have been guided by the following main research question and sub-question: *How to tackle the challenges faced by the administrations regarding the digital competences of both the citizens and the civil servants?*

- How can the administrations contribute to reduce the digital divide?
- How can we insure that the administrations go towards ever more digital innovation and flexibility while ensuring that people with no (less) digital abilities are not left on the side of the road?
- How can the administrations increase their attractiveness in order to be able to recruit people with specific digital skills?

ENABLERS

Among the three requirements identified in WP3, it was decided to focus more deeply on the "Public sector attractiveness", as the team's expertise was the strongest for this requirement and this is where it could be the most influential. However, some enablers are also provided regarding the "Digital divide" requirement. As the team does not have any impact on the budgetary choices of the governments, no enabler can be suggested for the last requirement "Lack of financial resources".

DIGITAL DIVIDE AMONG CITIZENS

The development of innovative and efficient e-services by public administrations presents challenges in terms of digital skills. Administrations must cope with the digital divide among citizens. Indeed, while some citizens expect administrations to be innovative and to follow the wave of the new technologies, others prefer to function the “old way” and to have personal contacts via visits to the administration. Therefore, the paradigm of “digital-by-default” should not become an “all and only digital” strategy, as citizens and businesses should be offered the opportunity to access administrative services through other channels as well. Nevertheless, it is desirable for administrations to increase the use of their e-services, by facilitating the access to e-services for all, and especially for people with disabilities or living in remote areas, and by making these e-services more user-friendly. This requirement is not specific to Belgium, as the EU Commission indicates that the principles of “digital-by-default”, inclusiveness and accessibility imply the creation of a “multi-channel³⁹ service delivery”, which allows citizens to access the administrative services anytime, anywhere and anyhow (European Commission, 2017e) .

Several leads for solutions exist to tackle this digital divide issue.

Firstly, according to the recent scientific literature, it appears that, in developed countries, the digital divide is an issue of lack of digital skills, rather than an issue of lack of access to technology. It is therefore necessary to improve data literacy – e.g. through dedicated programmes, e-learning opportunities and specific data literacy classes in the school curriculum – to provide people with the necessary skills to interpret and use data (United Nations, 2016).

Secondly, one-stop shops (OSS) can be created, where citizens or entrepreneurs can initiate, process and complete an administrative request in one single building or webpage, with the help of trained supporting staff who can guide the users through the process. This requires setting a catalogue of the services offered through the OSS and a standardised description of these services, ideally structured based on “life events” (European Commission, 2017e). Additionally to these OSS, “Public Internet Access Points” (PIAPs) can also be created. They can be established, in regions with poor communication infrastructure, in frequently visited institutions within rural areas, such as schools, libraries and community centres. These PIAPs provide access to the Internet and electronic content, and can also serve as the ICT education, consultation and knowledge centre (European Commission, 2017b). In Portugal, these PIAPs are referred to as “Citizen Spots” (European Commission, 2017c).

Thirdly, strong “once-only” policies, by which citizens and businesses supply information to a public administration only once, can be implemented. Indeed, by minimising the need for interaction, administrations can reduce the burden on citizens and companies. This requires a robust legal framework, to define which entities are the authentic sources of data, and which entities can access it (European Commission, 2017e). This “only-once” principle also optimises e-Service delivery, as it allows to prefill administrative forms via the exchange of information across administrations. In Belgium, for instance, part of the online tax form provided by the FPS Finance is already prefilled. Moreover, federal public administrations are subject to the “once-only” data collection law⁴⁰, according to which data should only be collected once from the citizen, and should then be circulated between the public administrations who need it for their public tasks.

As a final note, it should be mentioned that tackling the challenges outlined in this sub-section is complicated by the fact that administrations face major budgetary shortcomings that hamper the development of e-services. Indeed, doing “more with less” constitutes, in itself, an additional challenge.

PUBLIC SECTOR ATTRACTIVENESS

The development of innovative and efficient e-services by public administrations also requires to rely on highly

³⁹ Examples of such channels are call centres, counters, emails, instant messaging, interactive digital TV, interactive voice response (IVR) systems, mobile devices, personal computers, public internet access points, SMS or websites (European Commission, 2017e).

⁴⁰ Loi du 5 mai 2014 garantissant le principe de la collecte unique des données dans le fonctionnement des services et instances qui relèvent de ou exécutent certaines missions pour l'autorité et portant simplification et harmonisation des formulaires électroniques et papier, *M.B.*, 4 juin 2014.

skilled civil servants to design and build such innovative e-services. Yet, in Belgium, the public sector struggles to compete with the private sector when it comes to attracting specific strongly demanded profiles, such as IT specialists. Indeed, the public sector is rarely able to offer as interesting “extra-legal advantages” as the private sector, and it suffers from a negative image, namely that there are not enough innovative projects to work on compared to the private sector. This lack of public sector attractiveness can lead to unfortunate situations where administrations are unable to roll-out their e-service projects, due to a lack of sufficiently skilled personnel. This finding is not specific to Belgium. As indicated by the EU Commission, several administrations face shortages in key skills areas, such as IT, due to hard competition with the private sector and to the negative perception of public administrations as employers. Indeed, the traditional stereotype of public sector jobs being safe but staid, secure but low-paying, bureaucratic and rules-based is a stain that is hard to remove (European Commission, 2017e).

To solve this problem, a series of enablers for attracting and retaining IT profiles are presented below. These enablers have been identified thanks to a focus group organised with civil servants, specialised in HR, of the Federal and Walloon administration. It gathered four participants and it was held in Namur in mid-December 2017. This allowed to show that both entities were facing the same issues.

ENABLERS FOR ATTRACTING IT PROFILES

MORE FLEXIBILITY (IN TERMS OF DIPLOMA REQUIREMENTS, SALARIES, LENGTH OF CONTRACTS, SELECTION PROCEDURES)

In order to facilitate the attraction of IT profiles, more internal flexibility is needed. This flexibility should materialise in different forms.

Firstly, more flexibility is needed in terms of diploma requirements. Indeed, the administrations indicated during the focus group that it should be possible to recruit people with a lower degree than the one required, if the candidate already has some kind of relevant expertise for the position. To some extent, such flexibility already exists at the Federal level, which is desirable as a matter of principle, but it should not depend on a specific procedure.

Secondly, there is a need for flexibility in terms of salaries. Currently, there is none, as everything is scaled (the salary for function X is Y) and it is hard to derive from this. It is almost impossible to reward someone who works well in comparison with someone who doesn't. It is also extremely difficult to lay off someone who doesn't do his/her job correctly. It should be possible to adapt the salary depending on the profile, the market and the evolution of the situation. Right now, every modification takes too much time. This is a major challenge for the administrations. Rather than fixed salaries, the regulations should set a framework within which administrations have to operate, but where much more flexibility is given to each administration. It should however be noted that, at the federal level, for specific profiles such as IT specialists, there is already some kind of salary flexibility, as people with a bachelor degree can be paid the salary of someone with a master's degree. A suggested enabler to deal with such a situation is the structure taken by the non-profit organisation SMALS. It is owned by other public sector organisations and only provides IT services to organisations tasked with executing public service duties. However, it functions internally similarly to a private sector company. This enables SMALS to compete with private sector operators in attracting highly demanded IT profiles, by offering rewarding salary schemes and by being seen as being a cradle for innovation. A similar type of organisation also exists in Wallonia, namely the “Agence du numérique”.

Thirdly, flexibility is needed in terms of contract length. This has to do with an efficient use of resources. Indeed, for an extremely specific profile, such as an IT architect, it might not be necessary to hire that person long-term, but rather for a shorter 6 months period. Indeed, it might not be necessary to hire that person for the whole length of the project, but solely at the beginning. A suggested enabler here is to make it easier to hire people for such short contracts. For instance, SMALS could hire a person under an indeterminate length contract (CDI), but would then subcontract that person to other administrations for a specific short-term project. The DG Digital Transformation of the FPS BOSA could also play such a role, by creating a “pool of skilled people” (IT architects, developers, programmers...) who could be dispatched within administrations for short missions, depending on the specific

needs of the administration and on the profile of these skilled people. These “pools” could be motivating for the workers, who would get to work on a wide variety of different projects. Moreover, it could create more partnerships between the organisations.

Finally, more flexibility on the procedure is needed. A flexible framework should be set, in order to be able to adapt to the market, without waiting every time for the Minister’s approval. All these HR aspects should be more flexible, but the current procedures (created to fight against past abuses and to provide equal access to public functions to everyone) are not flexible enough. For the IT specialists, some administrations already adapt the procedures and do “one-day testing”.

MORE COMMUNICATION ABOUT ALL THE INNOVATIVE PROJECTS DONE IN THE PUBLIC SECTOR IS NEEDED

There is a great need to communicate externally regarding what the public sector can offer, in order to dust off the traditional negative image of the public sector. Indeed, the administrations don’t communicate enough on the recent evolutions and projects, nor about the interesting jobs that are offered.

As a lead for solution, administrations should engage in “active employer branding”, in order to wash-off the negative stereotypes, generate an appealing image and rebuild trust in the public sector (European Commission, 2017e). For instance, the FPS Finances has started to work with Randstad to conduct an analysis on the FPS Finances’ brand image. They organised a conference in this regard, pointing out their initiatives in terms of trainings and career coaches. Moreover, they started to work with the newspaper “Metro”, by valorising the “women’s career” and by communicating around the fact that the “glass ceiling” for women doesn’t exist at the FPS.

This need to communicate is especially true towards young people who just finished their studies, as they are, as said above, a privileged target for the public sector. Yet, university students do not know everything that can be done in the public sector. They think that there are only administrative office jobs, so they are not interested. There is a real need to target younger people, and be more visible to them. Surely, some civil servants attend job fairs in specific university faculties, but more needs to be done.

A lead for solution is to offer more traineeships to students, so that they can discover the public sector during their studies (discover the projects, the working sphere, the home working opportunities, the modern tools that are used). It is key to attract them at a moment where the public sector can be highly competitive with the private sector. Indeed, people who have several offers might be more attracted by the public sector if they already worked, during their studies, on innovative projects in the public sector. In this context, synergies with universities should be developed by having civil servants give specific presentations during classes. It is a win-win situation, as the university gives highly specific classes on the “real world” issues, and the administrations valorise their image. This allows breaking the wall between the reality and people’s perception of the public sector.

CONVINCING THE MANAGEMENT TO MODERNISE THEIR DEPARTMENTS

Finally, a fundamental requirement for increasing public sector attractiveness is convincing the administrations’ and departments’ management to modernise their way of working. Having a manager with a clear vision when it comes to projects is extremely important. If the manager has excellent knowledge about the stakes, and if he sets clear norms on the medium to long term, this common vision will carry people and everybody will follow. This will increase efficiency and also reduce sick leaves. Candidates will be more attracted to the public sector if they are aware that a clear vision is being followed, and that the former extremely hierarchical way of working has been replaced.

For instance, at the FPS Retirement, the new manager is reforming the formerly very hierarchical way of working and the teams have to manage themselves: they decide who the team-leader is, depending on the project. This seems to work, as people are much more involved in the project. This creates more discussion and implication in the project.

ENABLERS TO KEEP SPECIFIC PROFILES IN THE ADMINISTRATION

MOTIVATING THE CIVIL SERVANTS

Because of the digitalisation of the public sector, some civil servants no longer feel like they are working for the common good. Indeed, nowadays the distance between the administrations and the users/citizens is bigger, as everything is done through computers. This distance creates a “loss of purpose” for some civil servants, who do not feel like they are helping people.

Yet, this is not inevitable, as several studies have outlined the factors motivating people to join the public sector: people will usually be inclined to remain in the public sector for a variety of motives, which can be of a rational (commitment to a public program because of personal identification), norm-based (desire to serve the public interest) or affective (patriotism or benevolence) nature. In this regard, the administrations should not only focus on their traditionally perceived strengths, such as offering secure jobs with a good work-life balance, but should also focus on other motivating factors, such as attractive development opportunities.

FOCUS MORE ON “CONTINUOUS TRAINING” AND ON RE-ORIENTATION

A huge advantage in the public sector is the “continuous training policies”. Indeed, the administrations can offer IT specialists a five-year vision on where their career is going. This is not the case in the private sector, where the support in terms of career is much weaker. Therefore, the administrations should really push for these kinds of initiatives. Of course, this is not without risks, as it could be that some trained civil servants will then sell themselves better in the private sector afterwards. Therefore, it is a challenge for the administrations to make sure that they not only invest in the person, but also in the organisation.

In this regard, a lead for solution would be to push projects consisting in training people, whose current job will disappear because of the digitalisation, in order to reorient them professionally. For instance, one of the participants to the focus group suggested the idea to organise an “Internal IT Academy” in order to reorient civil servants into IT programmers (“Java Developer” for example). This could be done with people who want to change their career. Potentially, this could be done on an 8-month period, for this specific reorientation. A more ambitious plan could even be to create collaborations with universities in order to allow for such reorientation.

CREATING A TRUST RELATIONSHIP BETWEEN THE MANAGEMENT AND THE CIVIL SERVANTS

A trust relationship is key. It shouldn’t matter when and where the civil servants work, as long as the results are there. In this regard, a lead for solution is to grant more flexibility to the civil servants. For instance, many Federal Public Services have created some form of flexibility in their civil servants’ schedule. In essence, there are moments on the day where they are flexible, and others where they are not. For example, civil servants can arrive between 7 and 9.30 am; between 9.30am and 12 they have to be in the office; between 12 and 2 pm they can be at lunch (30 minutes, 1 hour, 2 hours); from 2 to 4 pm they have to be at the office; and starting from 4 pm they can leave. Despite this flexibility, there are still periods where they need to be at work, which allows to set meetings (between 9.30 am and 12, and between 2 and 4 pm).

9. LOCATION-BASED DATA

REQUIREMENTS

In WP3 Report, a number of requirements have been identified for the enabler Location-based Data, which can be grouped into four clusters, i.e. coordination; up-to-dateness and production of data; the production of the Belgian topographic map; and interoperability.

COORDINATION

A first requirement related to the cluster Coordination is the need for authoritative data, as it allows public administrations and organisations to exchange and combine different types of data in a more easy and efficiently way. Indeed, it was identified that, although authoritative data is under development within the federal administration, there is still an insufficiently developed legal framework to ensure a broad implementation of the concept of authoritative data in the federal administration. Also, it requires – besides the focus on the federal administration – an approach that includes the other higher Belgian public administrations.

Secondly, the approach taken on the publication of location-based data is, until now, too often focused on simply publishing the data in several formats. While this is indeed useful for those willing to reuse the data, it is also deemed necessary and useful to publish the data as a service, for example via APIs.

A third requirement is related to the publication of the location-based data. Publishing location-based data is a resource intensive task for the public administrations, and although the uptake of location-based data increases once it is published on a geoportal, questions remain on the extent to which the use of those geoportals has led to a decrease in the administrative efforts of the data providers, and an increase in the insights for the users of the data. Indeed, the increased use of geoportals needs to ensure that the overall administrative burden on data providers can be decreased, via a redesign of the administrative processes behind the data sharing.

UP-TO-DATENESS AND PRODUCTION OF DATA

Given the necessity to reconcile the need for increased efficiency within the public administrations with the need for correct and up-to-date location-based data, the public administrations need to reflect on the possibilities of collecting data via other means. Such possibilities could be an increased internal exchange of data, data collection via local administrations, the use of crowd-sourcing possibilities and the implementation of a reversed PSI Directive logic (private sector sharing data with the public sector).

PRODUCTION OF THE BELGIAN TOPOGRAPHIC MAP

It was underlined that the National Geographic Institute needs to consider a switch from producing primary data, towards the collection and translation of secondary data into national dataset(s). This could be the case for the Belgian topographic map, but also for other types of location-based datasets. This would ensure the availability of countrywide datasets, which are relevant for both the federal administrations and the private sector. It would also lead to a more efficient data collection approach.

INTEROPERABILITY

A first requirement related to interoperability is also related to the requirement for authoritative data sources mentioned above in the coordination cluster. It was underlined that the use of authoritative data sources needs to be increased, which requires a legal framework, but also that the processes for the use of authoritative data sources need to be streamlined. It is, for example, problematic to use copies of authoritative data sources, as it leads to a multiplication of datasets and to outdated data, since the data is not automatically updated in a copied file.

Secondly, the increased use of data is hampered by the strong variation that exists in the different licences that are used for offering data. Indeed, the lack of interoperability between the licences hampers the possibilities offered by potentially combining different datasets.

A final requirements relates to the INSPIRE Directive, which intends to increase the interoperability of datasets

around the EU. It was questioned to what extent the end-users of location-based data, both within the public administration and outside the public administration, require INSPIRE compliant location-based data.

RESEARCH QUESTIONS

It is important to underline that this section is structured differently from the other enabler chapters. This is because location-based data has been the underlying theme of the entire FLEXPUB project. As a consequence, the different other enablers have – both explicitly and implicitly – already discussed the topic of location-based data. Moreover, and as demonstrated by the guiding questions (see the paragraph below), the aspects dealt with in those guiding questions are already discussed in-depth in the chapters pertaining to the other enablers. This explains why this chapter is shorter than the other enabler chapters.

In the research, the researchers have been guided by the following research questions:

- *What are the criteria / conditions required for a dataset to be considered as an “authoritative source of data” – both within and across policy areas and policy levels?*
- *How can silos, within one policy level and between different policy levels, be removed?*
- *How can organisations, whose core task is disconnected from location-based data, be supported in using this data in their e-services?*
- *How can location-based data be made available for (re-)use to organisations whose core task is disconnected from location-based data?*

Before going deeper into the enablers of location-based data, a brief conceptual description is provided to ensure that the meaning of the concept is clear for all readers. Also, extra information is included on the different user groups.

The term ‘location-based data’ that is used throughout this report is an umbrella term for any data that has a location element. Other term for this, ‘geospatial data’, or ‘geodata’ are well known to specialists. In practice, those terms are used interchangeably. Location-based data is the record of where things happen. It tells us where people and objects are in relation to a particular geographic location, whether in the air, on the ground, at sea or under our feet. It includes, amongst other, and as suggested in the the UK's Geospatial Strategy 2020-2025 (UK Government, 2020):

- Foundational location data: Information where location is a key feature of its source and/or purpose for which it is used;
- Positional data: Datasets that describe activity or objects grounded in a particular place;
- Geospatial identifiers: Data that provides the means of linking different datasets using location as a common point of reference;
- Geospatial services: Higher-level insights and products, often involving layers or items of various types of location data.

In the early stages, geographic information development is data centric. There is data creation and integration, reduction of duplication, effective use of resources, and creation of a base from which to expand the productivity of the geographic information sector and market (Rajabifard et al., 2002, 2003). After a dataset has achieved sustainable quality in meeting the needs of primary uses, value-added use of the information is the driver (Masser, 2000; Rajabifard et al., 2003; Van Loenen, 2006).

Finally, three types of user groups can be distinguished (Van Loenen, 2006):

- Providers (the collectors and processors of information);
- Value adders (integrating, linking datasets, providing user-friendly access, developers of specialised solutions);

- End-users (consisting of decision-makers, citizens, and others that use the end-product of geographic information, for example, an animation, a map, an answer to a question, mostly through services provided by the tertiary users).

Each of these user groups can be found in government and administrations, in utility and public services, in the private sector, in research institutions and not-for-profit organisations.

ENABLERS

There are ongoing evolutions in the world of location-based data. First, there is a growing range of reference or basic location data providers. Second, the number of applications using and collecting location-based data is constantly increasing – although often not unambiguously understood by the end-user. Third, there is an exponential growth of spatial-temporal data generated via the Internet of Things (IoT). These evolutions imply that location is becoming more and more 'mainstream'. Indeed, location data is becoming increasingly mainstream in the data realm, although the different communities of location-data providers (GIS), developers (ICT), and end users are still far apart. Nevertheless, there are encouraging initiatives such as those of the Open Geospatial Consortium (OGC) working with the World Wide Web Consortium (W3C) on standards and protocols that are understandable and usable for all communities, so that the aforementioned communities can more easily start working together. But for the time being, it remains a great challenge to be able to see the forest through the trees, in the enormous diversity, and multiple duplicated initiatives to provide location-based data, in terms of reference location data as well as data with a location component.

Accordingly, we suggest below a number of potential enablers to deal with the requirements concerning location-based data.

INVEST IN AUTHORITATIVE DATA

The first aspect of the ongoing evolution is the broadening of location data providers. Departing from centralistic monopolies on location-based data (such as national mapping agencies), more and more actors are being established over the past decades, and continue to be established. In addition to the fact that, at the federal level, there are many silos of location-based data (such as the national geographic institute, the land registry, the national statistical office, the national register, the crossroads bank of undertakings, the police, fire brigades, emergency centers etc.), there are also many initiatives outside this federal arena. In Belgium, the regions have each set up their own regional mapping agency. Crowd-sourced initiatives such as OpenStreetMap (OSM) emerged, as well as commercial map producers such as *TomTom* and *Here*, but other map makers and providers also exist, such as *Google*, *Microsoft*, *Apple* and *ESRI*, to name only a few. It is expected that the providers' community will continue to broaden with the exponential growth of available aerial and satellite imagery and the development of AI that makes it possible to quickly create new maps, see e.g. the Copernicus programme. Moreover, crowd-source communities and companies such as *ecopia.com* also develop such services.

The increasing amount of location data providers leads to the need for public administration organisations to continue and increase their investments into authoritative data. Indeed, as demonstrated by the study of Cropvoets et al. (2019), the future role of national mapping agencies lies especially in the provision, both to the public and private sector, of data which can be considered as authoritative data. Providing data which is labelled as authoritative, and as such meets certain quality criteria, will ensure the relevancy of the organisations and will be beneficial for both the public and private sector (Cropvoets et al., 2019). It will increase, especially in the public sector, the efficiency of service delivery, since the same data can be reused several times, leading to a more efficient use of resources by the public sector.

USE THE INCREASING HETEROGENEITY TO COLLECT DATA

The Internet of Things (IoT) penetrates our everyday lives, being used to address a wide variety of real-life challenges and problems, and the location of objects becomes as such an increasingly important parameter. The exact location of measuring the physical world through IoT is highly relevant to understand local environmental conditions, or to develop powerful, personalised and context-aware location-based services and applications. Today, there are many

more smart devices (or objects) than five years ago. Smart devices produce massive volumes of data, i.e. flows of data with strong temporal and spatial features. Therefore, spatial analytical methods such as proximity, area, volume, and trajectory are of vital importance in analysing processes of objects. However, the variety of data sources related to the IoT has posed new analytical challenges, especially in the design and provision of a new class of analytical tools capable of handling real-time temporally and spatially referenced data from a plethora of heterogeneous smart devices (Trilles et al., 2017).

Despite the existence of tools capable of analysing temporal data in real-time, the same does not appear to be true for the spatial component. Space (i.e. location and orientation for all objects, and i.e. size and shape for larger objects such as cars) plays an indispensable role in the IoT, as objects-generated data have spatial properties and are spatially related to each other. Promising initiatives and platforms have recently emerged with the aim of performing spatio-temporal analysis in real-time (Granell et al. 2020). Despite these notable efforts, spatial support for the real-time analysis of IoT data is still in its infancy. As van der Zee & Scholten (2014) already noted, any IoT architecture should consider the geospatial component. Location provides a kind of 'glue' that efficiently connects smart devices. The authors proposed storing the location of each object and other geographic-related features such as orientation, size, and shape. However, the ability to handle and analyse the location of objects in near real-time is still limited with existing analytical platforms, despite its opportunities (McCullough et al., 2011; Rodriguez-Pupo et al., 2017).

At the roots of the changes in the production of location-based data are also technological evolutions, such as virtualisation and scalability of IT solutions, and new concepts such as Cloud, Fog and Edge Computing that imply important choices for handling data. With the enormous influx of data and the need to link it to location, an underlying geo-data infrastructure is needed to be able to link all of this. This requires a geodata structure that is linkable, and seamlessly cross-border. To achieve this, a common projection system and persistent identifiers for location-based objects are indispensable.

Recognising this increased (and still increasing) heterogeneity in the landscape of location-based data is of crucial importance for public administrations, and as such also for the Belgian federal administration. The landscape of location-based data includes a wide variety of actors, and whereas this could be considered as a threat for the public administrations collecting location-based data, it could also become an opportunity. Indeed, there is a potential in collaborating with non-public sector actors, such as private companies or crowdsourcing organisations, to collect data. This data could then be re-used by the public sector for the delivery of public services. A well-known example of this collaboration is the delivery of anonymised location-based data by Proximus to Eurostat and the FPS Economy – Statistics Belgium (Debusschere et al., 2016). The data is used for understanding, among others, population movements, which is crucial information for policy makers.

Making use of the increased heterogeneity of location-based data, via different kinds of collaborations between public and non-public sector organisations, is therefore advisable, as it notably the collection of location-based data.

INVEST IN CROSS-CUTTING ISSUES

There are many data silos, both within public administrations and government levels and between them. Those entities often understand that updating and improving these data silos is necessary, but they are often restrained in updating and improving these data silos due to the resource intensive investment that it requires. In particular, the entities mostly lack the necessary resources to change the processes that lead to those silos. Also, the means to build a common solution that exceeds the individual interest of the organisation or level are often lacking.

A first enabler to deal with this difficulty is organisational. In order to get an overview of the existence of the different silos, and especially of the needs that led to the creation of those silos, one needs an entity that can capture and consolidate these needs and translate them into concrete data needs, match this with the offer of data on the market (governmental and private), and receive the mandate and the budget to facilitate overarching solutions or hubs.

A second enabler is related to the way of presenting the challenge. Focusing on specific cross-cutting issues and

topics (such as transport, emergency services, health care, energy, water, and construction) is required, rather than focusing purely on the integration of datasets *for the common good*. Approaching it from specific cross-cutting issues and topics will set a sense of urgency among the different actors involved. It will, as such, lead to the setting of concrete steps towards governmental and domain overarching solutions, intentionally leading to rationalisation and consolidation of data creation, use and potentially reuse. Creating this sense of urgency is one of the crucial driving factors for cooperation.

DEVELOP APPROPRIATE GOVERNANCE STRUCTURES

From a governance perspective, it is important for location-based data that the appropriate governance structures are developed. The importance of governance structures, also in the field of location-based data, has been discussed in detail in Chapter 5 - Organisational Structures. This section includes three examples of overarching governance approaches. It is important to underline that those approaches can be combined. Indeed, the use of one governance approach does not exclude the other approaches.

CENTRAL ORGANISATION PLAYING THE ROLE OF FRONT DRIVER FOR LOCATION AND DIGITAL GOVERNMENT TRANSFORMATION

One governance possibility for the reform of governance structures is focused on the integration of location strategies in the mission of the central organisation responsible for digital transformation. There are two particular reasons why this could be relevant. Firstly, it can potentially lead to the mainstreaming of *location* in the broader data realm, and secondly, it can ensure a stronger embedment of location-based services in the national data-service infrastructure. The first reason is, at the same time, also the main counter-argument often expressed. Indeed, there is a potential risk that the inclusion of the location-based data in the broader realm of all data will lead to (1) insufficient expertise on the topic of location data and (2) insufficient attention, and potential use, of location-based data.

Six European Member States follow this governance approach (Barbero et al., 2019):

- Bulgaria, in which the state eGovernment agency SEGA is also in charge of the spatial data infrastructure (SDI) since 2016.
- Denmark, in which the agency for digitalisation is in charge of leading and coordinating both SDI and Digital Government Transformation.
- Finland, in which the Ministry of Finance has the lead based on the renewed Spatial Data Strategy 2016.
- Malta, where the MITA drives SDI and digital transformation altogether.
- Norway, where this role is played, within the Ministry for Local Government and Modernisation, by its agency for Public Management and eGovernment (DIFI).
- The Netherlands, in which Geonovum takes the driving seat.

From a regional perspective, the case of Flanders is well known as an example to integrate the use of location-based data into the broader data realm, leading to an integrated governance structure.

If this logic were to be adopted at the Belgian federal level, it would be advisable to first of all designate a central organisation for the interlinking and rationalisation of geodata, and to indicate the authoritative datasets for this purpose. It goes without saying that this would be in closer cooperation with the DG DT of FPS BOSA, as a result of which 'location' could become a fundamental part of the federal data infrastructure.

STRONG STAKEHOLDER NETWORKS

Some countries are characterised by a very strong stakeholders' representation, and openness towards inputs from academia and the private sector. This is the case for some of the Nordic countries (Finland and Denmark in particular) but also for Croatia and Spain (Barbero et al., 2019). Spain is one of the good examples of stakeholder inclusiveness. The governance approach for the INSPIRE implementation in Spain has been historically open to

involvement of different types of stakeholders, including private sector and academia. Finland has a National Spatial Data Network, which includes more than 350 experts from around 150 organisations. The network consists of public administrations, private companies, municipalities and academic institutions. However, it is unclear how much weight the network has in taking decisions about SDI developments. In Croatia and Denmark, the participation to the Working Group on SDI and eGovernment and Coordination Committee is open to any natural person (coming from any type of organisation, whether public, private or academia).

This kind of governance approach can be connected to the above-described approach, and allows creating a widely supported approach towards location-based data.

If this logic were to be adopted at the Belgian federal level, the creation of strong stakeholder networks (of producers, end users, and distributors) would make it possible to offer more user-centric data, to adjust processes and also to uncover and address ambiguities in the creation, management and distribution of that data.

INTERMINISTERIAL COMMITTEE AS LEGAL INSTRUMENT

A third relevant governance approach is the interfederal cooperation. This kind of cooperation exists for example in Germany (Bundesministerium des Innern, n.d.). In Germany, an Interministerial Committee on Geo Information (IMAGI) consisting of federal and regional (Bundesländer) representatives takes the lead in the conception of an efficient (location-based) data management system for geo-data at the federal level, fed by input from the regions. It also conceived a meta-information system for federal geo-data, realised a geo-portal for federal geo-data, it optimises the technological and organisational responsibilities for the maintenance of geodatabases (e.g. by the introduction and implementation of standards, including licensing), it supports further referencing to and re-use of the data, it promotes awareness of location-data through PR-work, and it drives forward a location-data infrastructure for Germany.

It has been demonstrated by literature (e.g. the Australian federated example of (Masser & McDougall, 2009) that driving factors for the development of partnerships are amongst others mutual business needs, resource scarcity, common or shared organisational goals (reciprocity), and the risk of organisational uncertainty (change). The findings of this research highlight the need for clear strategic goals, responsive negotiation structures, and evolving governance models as projects mature. The authors also emphasised that once relationships have been established, interaction between the partners becomes easier within a trusted and cooperative framework, although they need to be constantly nurtured and frequent communication between the partners is essential.

If this logic were to be adopted at the Belgian federal level, an intergovernmental platform at ministerial level could be a solution (1) to support the need for cooperation and (2) to answer the call of producers and users of geodata for consistent datasets across different levels of government, rather than having many different and separated datasets about the same phenomenon.

INVEST IN CROSS-DOMAIN PROTOCOLS AND STANDARDS

By joining international standardisation communities, such as the OpenGeospatialConsortium, one can firstly contribute to the development of cross-domain standards and protocols (such as SensorThings API and OpenAPI), making specific issues such as *location* addressable in a generic way (W3C-compliant), and ensure that one's own needs are also taken into account in that development. Secondly, as an organisation, one can learn from and contribute to such global communities of practice for the implementation of such standards. Thirdly, by joining international standardisation communities, one can work towards common standard(s) in a neutral environment, thereby potentially eliminating local, regional and national deadlocks, and also making way for the use of more generic software solutions, rather than local and specific software solutions. An international governance framework for the development of standards offers a potential environment for the elimination of local, regional and national disagreements.

INCREASE TRANSPARENCY OF LOCATION

As an organisation that develops or manages an e-service, it can be quite challenging to have an overview of the

data landscape and to know which dataset is most suitable. Although within one administration there can be several entry points to find the suitable data, it is quite challenging for non-specialised organisations (in this case non-location-based data oriented organisations) to find the required data (in this case location-based data).

There are also datasets at different levels of government, for example for roads, watercourses, buildings, land use, etc. For end users dealing with these different levels of government, this diversity can be very confusing and lead to incompatible e-services because public administration organisations can, because of the difficulties in finding suitable data, use different datasets pertaining to the same, or almost the same, things.

This is challenging as it leads to increased data diversity (which is in itself not a problem, but it becomes a problem without coordination or a well-structured approach to deal with this diversity), data incompatibility, and a loss of resources to invest in the primary objective, namely serving the end users. Data portals, such as public administration geo portals, help to make datasets findable and accessible. Such a portal can contain both authentic and non-authentic data. Identifying authentic data sources also helps to make the datasets visible. However, data portals developed within and for a single public administration do not solve the challenge of end users who are struggling to compile data from various public administrations, and who are still using incompatible data as a result. Those end users can be organisations within another public administration, it can be private sector organisations, citizens etc.

For example, some use the authentic sources of the regions and manually merge them into a countrywide dataset, i.e. a federal dataset. Others use the federal data sources, which are sometimes less and sometimes more up-to-date than the regional data sources. Others seek salvation in an open-source solution such as *OpenStreetMap*, or commercial solutions - such as *BelMap* - that attempt to bring together the patchwork of datasets, combined with their own data products, such as *TomTom*, *Here*, and so on.

The development of data portals are, as such, an enabler, and ensure that organisations can find the data they require. The data portals ensure that data is findable and accessible. Those portals have to provide an overview of the different datasets that exist for the different location themes (cf. INSPIRE / ISO19115). Also, it would be relevant to indicate on the data portals how the datasets can be used (what is the application area) and what the usefulness of the different types of data is. It would also be relevant to indicate the relevancy of datasets for potential e-services, and potentially relevant software, tools and standards for the different datasets. Although the inclusion of this type of information for the different datasets might be resource intensive for the data providers, it could be a way to ensure that non-expert users from a non-location-based data organisation have an improved view on the possibilities offered by the datasets on the data portal.

Besides the potential of further developing data portals, a knowledge repository could also be a positive evolution in the further development and use of a geo-data infrastructures or ecosystems. Such a knowledge repository, which could have the form of a wiki-style website, can encompass:

- **Guidelines** that tell the organisation which standards can be used for a certain digitisation process. Each guideline can depart from a concrete situation and give a number of instructions on how to deal with a particular situation.
- A **standards register** that contains an overview of all standards that apply in the location domain, that includes preferably also other preferential data standards in which the concept of location is applied according to the standards of the geo-community, and that helps to develop services that comply with the FAIR-principles (Findability, Accessibility, Interoperability, Reuse of digital assets).
- A **software register** that contains an overview of software packages and other tools to create, edit, describe, manage, preserve and publish the location-based data.
- A **publications overview** that lists an overview of publications that can help to apply guidelines, standards and software in practice.
- A **glossary**, referring to a list of specialist terms related to location-based data.

10. INTEGRATION: CROSS-CUTTING POLICY OPTIONS

OVERALL APPROACH

On the basis of the outcomes of, among other, this WP, the research team has been able to identify a number of Strategy Priorities, which are described in the Strategy for Flexible Geospatial Public e-Services (WP6). In this section, those Strategic Priorities will be cross-checked with two highly relevant other strategies, i.e. Digital Belgium (2015-2020) and Sustainable Development Goals (2015-2030), and in particular Goal 9 and Goal 16. In what follows, the content of Digital Belgium and the Sustainable Development Goals, is described.

Afterwards, the identified Strategic Priorities are described and cross-checked in relation to the content of Digital Belgium and Goal 9 and 16 of the Sustainable Development Goals. On the basis of this cross-check it can be concluded whether the identified Strategic Priorities are cross-cutting policy options or not.

FEDERAL GOVERNMENT'S "DIGITAL BELGIUM" PLAN (2015-2020)

In 2015 the Belgian federal government and administration developed the Digital Belgium Strategy. It "is the action plan, which outlines the digital long-term vision for [Belgium] and translates this into clear ambitions.". It aims to put "Belgium more firmly on the digital map (...) [as] citizens and businesses need to be able to conduct all communication with the government digitally by 2020, via user-friendly channels" (Federal Overheid, 2015). The five priorities are:

- **Digital infrastructure:** "Every year mobile traffic doubles, and internet traffic doubles every two to three years. Investment into digital infrastructure is necessary so that the digital economy can continue to grow. "Digital Belgium" is focussing on a state-of-the-art network infrastructure, which is ready to fully exploit the "internet of things" and "big data"" (Federal Overheid, 2015).
- **Digital confidence and digital security:** "In order to be able to grow, the digital economy needs confidence and security. That means respecting rights and strategically and effectively tackling illegal practices. Only when citizens and businesses have full confidence that their data is safe online, can the digital economy achieve its full potential" (Federal Overheid, 2015).
- **Digital government:** "Both citizens and businesses need to be able to conduct all communication with the government digitally by 2020 and to be able to do so using a user-friendly channel" (Federal Overheid, 2015).
- **Digital economy:** "According to calculations by the Lisbon Council, over the next few years digital innovations will be responsible for creating five new jobs for every two that disappear. Digitalisation encourages people to be entrepreneurial and brings new players into the field. The result is more robust competition, more innovation and increased quality of service. "Digital Belgium" supports an approach, which boosts the digital economy and expands the prospect of jobs and growth" (Federal Overheid, 2015).
- **Digital skills and jobs:** "In the future, nine out of ten jobs will require digital skills. Governments then also need to monitor that as many citizens as possible, irrespective of their age and background, are able to take advantage of the necessary digital opportunities. Obtaining the minimum amount of digital skills is crucial for this" (Federal Overheid, 2015).

Within the priority "Digital government", attention is devoted to the need for (1) a digital portal, (2) businesses and start-ups, (3) the next generation open data and (4) operational efficiency. Those four sub-priorities are defined hereunder. The list has been updated in 2017, when the priorities were updated, and reduced to three sub-priorities: (1) Mobile ID (itsme®), (2) Government Cloud (G-cloud) and (3) Open Data. Those renewed three sub-priorities are also defined hereunder.

DIGITAL BELGIUM – PRIORITY DIGITAL GOVERNMENT – 2015 SUB PRIORITIES

DIGITAL PORTAL

“Citizens must be able to report all of their ‘life events’ to the government digitally. By using a single user-friendly high-performance digital portal, citizens will be able to make use of all of the federal government’s services. Everything in one place: citizens need to submit their personal data to the government, assuming it remains unamended, once only and do not need to resubmit it over and over” (Federale Overheid, 2015).

BUSINESSES AND START-UPS

“Businesses must be able to submit all important key events digitally. The emphasis in this must be on developing a digital process for establishing a business, and digital processes for editing information recorded in the ‘Kruispuntbank voor Ondernemingen’. Unamended data only needs to be submitted once, and not resubmitted over and over. This will significantly lighten the administrative load. The government will also support innovation by giving start-ups a chance at government contracts” (Federale Overheid, 2015).

NEXT GENERATION OPEN DATA

“Public data belonging to the federal government must by definition be accessible, with a few exceptions based on privacy and security. Transparent access to data means a better democratic process. That is why we will ensure that this data is accessible in a user-friendly manner using a single open data portal” (Federale Overheid, 2015).

OPERATIONAL EFFICIENCY

“Government management will be encouraged to carefully follow ICT government contracts and to create efficiencies by further digitizing services and processes. The government will also utilise new technologies, such as social media and big data, and shall do so with a clear objective: providing better services at lower cost” (Federale Overheid, 2015).

DIGITAL BELGIUM – PRIORITY DIGITAL GOVERNMENT – 2017 SUB PRIORITIES

MOBILE ID (ITSME®)

“Itsme® is the mobile version of a physical ID (which it complements). This mobile app allows every Belgian to unequivocally prove his identity online, hence replacing card readers and the many passwords on the Internet. Itsme® can be used for example to make a payment in a webshop, to sign an online document or access governmental services online. Itsme® is the result of a unique collaboration between the four major banks and the three major mobile network operators in the country that bundled their powers in the Belgian Mobile ID consortium. The Belgian Federal Government recognises Itsme® as a trusted authentication mechanism to access its online services (and will recognise other private players who offer similar security level)” (De Croo, 2017).

GOVERNMENT CLOUD (G-CLOUD)

“The G-Cloud is a hybrid cloud that uses services offered by private companies in public cloud environments and services housed in state-owned data centers. The G-Cloud catalogue is managed by the State, allowing for significant cost savings while facilitating roll-out of new applications and technologies. For the development and operational functioning, the private sector is widely used. The service catalogue of G-cloud ranges from shared physical infrastructure (storage, virtual machines...) to platforms (business intelligence and data analytics), or applications (web content management, authentication services...). The range of services is gradually extended and improved according to the actual needs of the participating institutions” (De Croo, 2017).

OPEN DATA

“Public data belonging to the federal government must be accessible, with a few exceptions based on privacy and security. Transparent access to data means a better democratic process. That is why we will ensure that this data is accessible in a user-friendly manner using a single open data portal. The federal open data strategy includes an

ambitious view on open data and several concrete action points by 2020. A bill that supports this strategy and regulates the reuse of government information will be passed, as the transposition of the 2013 European PSI Directive, which is an important part of the European Open Data Strategy and Digital Agenda” (De Croo, 2017).

UNITED NATIONS’ SUSTAINABLE DEVELOPMENT GOALS (2015-2030)

The FLEXPUB Research project can be connected to the Sustainable Development Goals (SDGs) via a number of targets set in the SDGs. The targets to which FLEXPUB can be connected are presented hereunder.

SUSTAINABLE DEVELOPMENT GOAL 9

SDG 9 aims to “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation” (United Nations, 2015b). In particular target 9.C is directly relevant in the context of FLEXPUB: “Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020” (United Nations, 2015b).

SUSTAINABLE DEVELOPMENT GOAL 16

SDG 16 aims to “promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels” (United Nations, 2015a). In particular the following targets are directly relevant in the context of FLEXPUB:

- 16.6: “Develop effective, accountable and transparent institutions at all levels” (United Nations, 2015a).
- 16.7: “Ensure responsive, inclusive, participatory and representative decision-making at all levels” (United Nations, 2015a).
- 16.10: “Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements” (United Nations, 2015a).

From a Belgian perspective, the different public administrations have a crucial role to play in the implementation of those SDGs, and in reaching the different targets set. Therefore, those SDGs are important to take into account in the development of the Strategy and Blueprint, and in the development of the strategic priorities and cross-cutting policy options.

STRATEGY FOR FLEXIBLE GEOSPATIAL PUBLIC E-SERVICES – STRATEGIC PRIORITIES

The strategic priorities, identified for the first cycle of the Strategy for Flexible Geospatial Public e-Services (WP6), support each of the three pillars identified in the Strategy. In what follows, the strategic priorities will be cross-checked in relation to the content of Digital Belgium and Goals 9 and 16 of the Sustainable Development Goals.

INCREASE THE UPTAKE OF OPEN DATA (OPENNESS)

DESCRIPTION

While numerous initiatives have been taken by administrations in terms of Open Data, and while some administrations are more advanced than others on the topic, there is still a clear need to increase the uptake of Open Data. In this regard, the priority should be set on ensuring a sustainable “Open Data funding” of the fixed and marginal costs of Open Data, and on determining on which open datasets it should be invested the most, in light of their value for re-users.

CROSS-CHECK WITH DIGITAL BELGIUM

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the key principles of Digital Belgium:

- **Digital infrastructure:** Limited overlap
- **Digital confidence and digital security:** Medium overlap
- **Digital government:** High overlap

- **Digital economy:** High overlap
- **Digital skills and jobs:** High overlap

CROSS-CHECK WITH SDG GOAL 9 AND SDG GOAL 16

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the SDG Goal 9 and SDG Goal 16:

- **SDG Goal 9:** High overlap
- **SDG Goal 16:** High overlap

STRENGTHEN COORDINATION ACROSS LEVELS OF GOVERNMENT (COORDINATION)

DESCRIPTION

It is key to strengthen the coordination across the various levels of government and administrations. In this regard, the priority should be set on building common services and data approaches to stimulate cooperation, on multiplying intergovernmental projects, on creating intergovernmental coordination bodies to coordinate policies across levels, on setting-up exchange programs for civil servants, and potentially on creating an "Intergovernmental project fund".

CROSS-CHECK WITH DIGITAL BELGIUM

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the key principles of Digital Belgium:

- **Digital infrastructure:** Medium overlap
- **Digital confidence and digital security:** High overlap
- **Digital government:** High overlap
- **Digital economy:** Medium overlap
- **Digital skills and jobs:** Low overlap

CROSS-CHECK WITH SDG GOAL 9 AND SDG GOAL 16

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the SDG Goal 9 and SDG Goal 16:

- **SDG Goal 9:** Low overlap
- **SDG Goal 16:** Medium overlap

INTEGRATE THE INPUT FROM CITIZENS AND EXTERNAL USERS (PARTICIPATION)

DESCRIPTION

The administrations should pay greater attention to the needs of their users and should further integrate their input. Having a truly user-oriented focus is fundamental for administrations. In this regard, the priority should be set on increasing user participation in the development of e-services, through the use of complementary online and offline methods. Another priority is to stress the importance of resorting to Agile methods, in order to be more flexible and to better include the users' evolving needs.

CROSS-CHECK WITH DIGITAL BELGIUM

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the key principles of Digital Belgium:

- **Digital infrastructure:** High overlap
- **Digital confidence and digital security:** Medium overlap
- **Digital government:** High overlap
- **Digital economy:** Medium overlap
- **Digital skills and jobs:** Low overlap

CROSS-CHECK WITH SDG GOAL 9 AND SDG GOAL 16

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the SDG Goal 9 and SDG Goal 16:

- **SDG Goal 9:** High overlap
- **SDG Goal 16:** High overlap

GUARANTEE PERSONAL DATA PROTECTION AND SECURITY (OPENNESS)

DESCRIPTION

In light of the recent entry into force of the GDPR in May 2018, administrations need to ensure that they comply with this legislation. In this regard, the priority should be set on ensuring that the civil servants implement it correctly in their daily work, and on ensuring that the administrations understand that compliance is a daily challenge, rather than a “one-shot” (being compliant today does not necessarily mean being compliant tomorrow).

CROSS-CHECK WITH DIGITAL BELGIUM

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the key principles of Digital Belgium:

- **Digital infrastructure:** Medium overlap
- **Digital confidence and digital security:** High overlap
- **Digital government:** High overlap
- **Digital economy:** High overlap
- **Digital skills and jobs:** Medium overlap

CROSS-CHECK WITH SDG GOAL 9 AND SDG GOAL 16

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the SDG Goal 9 and SDG Goal 16:

- **SDG Goal 9:** Medium overlap
- **SDG Goal 16:** High overlap

SET-UP OF A FEDERAL SHARING PLATFORM AND CATALOGUE FOR INTERNAL FEDERAL USE

DESCRIPTION

Regarding the Geo-orientation strategic actions, the priority should be to **focus on setting up a federal sharing platform and catalogue for internal federal use** (containing geo-datasets and metadata).

CROSS-CHECK WITH DIGITAL BELGIUM

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the key principles of Digital Belgium:

- **Digital infrastructure:** High overlap
- **Digital confidence and digital security:** Low overlap
- **Digital government:** High overlap
- **Digital economy:** Medium overlap
- **Digital skills and jobs:** Low overlap

CROSS-CHECK WITH SDG GOAL 9 AND SDG GOAL 16

In order to execute this cross-check, the research team has assessed to what extent this suggested strategic priority is in line with the SDG Goal 9 and SDG Goal 16:

- **SDG Goal 9:** High overlap
- **SDG Goal 16:** Low overlap

11. RISKS AND IMPACT ASSESMENT

This section presents an analysis of the risks that could prevent the implementation of the enablers mentioned in Chapters 3 to 9, and of the likelihood of occurrence of those risks. The focus here thus lies on risks that could lead to the *non-implementation* of the suggested enablers. The likelihood of occurrence of these risks is then presented as being: (i) very low; (ii) low; (iii) moderate; (iv) high; or (v) very high. Risk mitigation factors are then proposed, which suggest actions to circumvent the risk, or circumstances that reduce the risk's impact. Finally, the consequences of the lack of implementation of the enablers are outlined in an impact assessment. All of these elements are presented Table 11 below.

Table 11: Risks and Impact Assessment

Enablers	Risk that could prevent the implementation of the enabler	Likelihood of occurrence of the risk (very low – low – moderate – high – very high)	Risk mitigation factors	Consequence of the non-implementation of the enabler
Principles, policies and frameworks				
<i>Open data</i>				
Sustainable funding	Lack of Federal government	Very low Though political crises seem to become the norm after Federal elections in Belgium, the probability that a Federal government will eventually be formed is high.	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament.	<ul style="list-style-type: none"> ○ A lack of funding might induce a lack of Open Data. Some very useful datasets may thus not be made available for re-users. ○ A lack of funding might also induce a lack of update of the datasets that were provided to re-users. This leads to a loss of value and of relevance of the said data. ○ As, under the 2019 PSI Directive, public administrations will have to share “High-value datasets” for free, this could entail critical budgetary difficulties for administrations (such as the National Geographic Institute) who previously had the possibility (under the 2013 PSI Directive) to ask a more substantial fee for their open dataset than other administrations, as they had to partly fund themselves. This will no longer be an option under the 2019 PSI Directive and this will have a high financial impact on these administrations if a sustainable Open Data funding mechanism is not
	Lack of reform of the Open Data funding mechanism	High This issue does not seem to be on the current political agenda, and it would be a big step to depart from the existing situation where each administration must fund its own Open Data initiatives.	Use of “Freemium” models (public data is shared freely, but the administration could sell services built on top of this data to third parties) could allow the public administrations to compensate for the lack of budget they receive.	

				provided for.
Awareness raising about the benefits of Open Data	Resistance to change	<p>Moderate</p> <p>The approach towards Open Data in public administrations is case specific (and even “person specific”) and some administrations will be more resistant to change than others.</p>	<ul style="list-style-type: none"> ○ Several “Open Data Champions” have already been designated in some administrations, and their role is to promote Open Data within their administration. To strengthen their impact and to structure their initiatives, a network of such “Champions” could be created. ○ Some initiatives are already undertaken by public administrations to collaborate with research institutions or private sector actors in order to raise awareness about the benefits of Open Data (for instance, master students in computer science, mathematics and business of the University of Namur were asked, in the context of a data science class, to create an App on the basis of the Open Data from the city of Namur). 	If civil servants are not made aware about the benefits of Open Data and about the high-value and initiatives that can potentially derive from their efforts, there is a risk that they will not invest sufficient time in the upload, maintenance and update of open datasets. This is because, they will not see the benefit but only the costs it incurs. As a consequence, the quality of the data made available will likely be low.
Harmonisation of re-use licences	Lack of political agreement	<p>Low</p> <p>In the context of the implementation of the INSPIRE Directive, the different levels of power in Belgium need to collaborate and one of the</p>	Because the PSI Directive prevents the hampering of re-use possibilities due to strict licensing conditions, the licences (though potentially different) already mostly contain the same	A lack of harmonisation of the licences of the different data publishers (e.g. the Federal administration, the Regions, etc.) could lead to interoperability issues for re-users wishing to gather data from different sources, if these licences

		discussion points is the issue of the harmonisation of licences. This debate could then be broadened to other re-use scenarios.	provisions. This is also due to the fact that they all mostly take inspiration from the well-known Creative Commons Licences, and notably the CC-0 and CC-BY licences.	contain incompatible provisions. As a consequence, potentially innovative re-use services will not be created due to the high cost that the extra-work deriving from these interoperability and incompatibility issues would entail.
Personal data and security				
Taking personal data protection and security concerns into account from the start	Lack of knowledge and/or respect of the legislation	Very low The adoption and entry into force of the GDPR has been massively relayed in the media and in professional circles, and a lot of sensibilisation about the importance of personal data protection has ensued.	The GDPR provides for severe sanctions in case of infringement, which should ensure that its existence is known and that it will be respected.	<ul style="list-style-type: none">○ If public administrations overlook their personal data protection obligations (whether knowingly or unknowingly), this could entail severe consequences for the citizens. For instance, unlawful collection of the citizens' data could have a negative impact on their taxes or their right to receive a specific allocation, if they are not able to verify why this decision has been taken or if they are not able to rectify the data about them that the administrations possesses.○ A failure, by the public administrations, to adopt the necessary organisational and technical security measures could open the door to security breaches, leading to unlawful use of the data by ill-minded third parties. This could have devastating consequences for the citizens.
	Lack of enforcement of the legislation by the Data Protection Authority	High Though the powers of the Data Protection Authority have been extended, its budget has not increased enough and it will have to function with limited means. Moreover, the DPA has announced that it did not intend to order fines against the public administrations for potential breaches.	Even if the Data Protection Authority fails to play its role, data subjects nevertheless have the possibility to launch (class) actions in front of civil courts.	
Digital-ready legislation				

Use of digital-ready legislation	Resistance to change	Moderate Though such an approach is not common for the Belgian legislator, the influence of the European “Better Regulation” guidelines, and best practices from other Member States, could lead to a mentality shift.	<ul style="list-style-type: none">Some legislations already provide for some form of “digital readiness”, such as the “Only-once” legislation.Most legislations take a “technologically neutral” approach, in order for them to be sufficiently flexible and to include potential future technological developments in their scope of application.	A lack of consideration for the existing technical environment, when a law is adopted, could lead to inefficient laws that fail to address the core issues that they were aiming to tackle. It could also lead to unnecessary duplications of infrastructural resources and might complexify the workflows.
	Lack of Federal government	Very low Though political crises seem to become the norm after Federal elections in Belgium, the probability that a Federal government will eventually be formed is high.	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament.	
Processes				
Use participation methods in general	Motivations of users	High Motivating people to participate is always challenging due to the time-consuming nature of the process	Several papers exist about the motivation of citizens to participate in an e-government context and could be a basis for the strategy. Furthermore, public agents could be used as proxies if no citizens are motivated to participation.	<ul style="list-style-type: none">If the administration fails to use participation methods in a representative manner or if some citizens are not motivated to participate, the requirements identified might not be representative of those of the full population. Therefore, essential requirements for certain groups (e.g.: people with less digital skills) might not be taken into account.
	Representativeness	Moderate The requirements can be representative if enough efforts	In order to be representative, public agents can set goals in term of socio-demographic	

		are made.	characteristics. Furthermore, complementary participation can be used to ensure the representativeness. With proper sampling and quotas, this risk can be mitigated and the enabler implemented.	<ul style="list-style-type: none"> ○ If the administration fails to use participation methods, no sense of priorities will be available for the software developers and the requirements of citizens will be taken for granted. ○ If the administration fails to use participation methods, public servants might simply develop the e-service for internal use only.
	Conflicting requirements	Low The requirements of users should in theory be aligned with the goals of public administrations.	The requirements could be modelled using modelling language such as I* to ensure the coherence between the goals of all stakeholders. The enabler can be implemented using the appropriate language.	
	Resistance to change	Moderate Not all public servants are convinced by the relevance of participation, but minds are changing.	Trainings and success stories could be disseminated in the administrations to decrease this resistance. If the public organisations have enough budget/time to organise trainings, the enabler can be implemented, and the risk mitigated.	
Coherent use of online and offline participation methods	Digital Divide	High Citizens have to have digital skills to use online participation methods such as online platforms.	Efforts can be performed to improve the usability of the online methods so that non-expert citizens can access these methods. Furthermore, off-line complementary methods can be used to gather input from the citizens with low digital literacy.	If the coherent use of online and offline participation methods is not implemented, essential requirements for citizens with lower digital skills might not be gathered.
Organisational Structures				

Increased information sharing	Lack of willingness to increasingly share data with other federal organisations	Very low Although organisations can have the tendency to protect their organisational interest, it is in the broader federal interest to share information to increase the user-experience.	Sufficient political support, as well as continuous attention for information sharing, via, among others, the once-only principle can help in increasing the information sharing.	Not taking this action will lead to a continuation of the current approach, where end-users are requested to share information with the public administration that is already known by the public administration. As technology and the legal framework allow for an increased information sharing, the non-implementation of this enabler will result in a decrease of the user-satisfaction.
Interoperability	Security and privacy concerns	Very low A number of European countries are cautious on the implementation of interoperability measures, due to the potential security and privacy risks.	Continuous attention for security and privacy concerns can reduce this risk. Both within the federal administration and the regional administrations, a number of actors are charged with ensuring that sufficient attention is devoted to security and privacy concerns. Moreover, the federal administration is already taking actions to increase the interoperability and there is no doubt that this will also continue in the future.	Different administration will continue to offer services, but the lack of legal, organisational, semantic and technical interoperability, as well as the lack of an integrated public service approach, will lead to decrease of the service quality for the end-users.
<i>Increased Federal Coordination</i>				
Developing a common approach	Lack of federal government	Low The lack of a federal government risks to lead to a lack of political pressure to develop a vision. Also, though political crises seem to become the norm after	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament. It can also be expected that a government will be formed, leading to the	The non-development of a common approach will lead to a situation where the different organisations do not align their various digital policies, or only align their digital policies when they proactively connect their policy with other organisations. This will lead to a

		federal elections in Belgium, the probability that a federal government will eventually be formed is high.	disappearance of this risk.	decrease in the user-experience and the offering of integrated federal e-services. It has to be underlined that the enabler includes a specific reference to the fact that such a common approach needs to guarantee sufficient organisational freedom to each organisation.
	Lack of political support, even when there is a federal government	Moderate Given the high amount of existing needs, there is a risk that the administration needs to focus on other topic than (geospatial) e-services. However, various political actors have underlined the importance of digitalisation.	The top-management of federal organisations can continuously strive to gain attention from the political level for the topic, and pro-actively present the development of a federal vision to the political level. If there is a lack of willingness to develop a common vision within the administration, then no specific action can be taken to handle this risk.	
	Lack of willingness within the administration to agree on a common vision	Low Administrations might agree on the importance of digitalisation, but not necessarily on the specific priorities. Also, administrations are guided by different Ministers (political guidance) and have different thematic priorities. Nevertheless, there is a willingness to collaborate.	The current organisational structures, and use of coordination instruments, already allow the federal administration to develop a federal vision. A further strengthening of the coordination via the suggested “Organisational Structures” enablers will further intensify the possibilities for the development of such a vision.	
Creation of a CIO	Lack of federal government	Low The lack of a federal government risks to lead to a lack of political pressure to develop a vision.	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament. It can also be	Not creating the position of CIO will lead to a situation where the applied coordination instrument will remain focused on network instruments. This will make it more difficult for the federal

		Though political crises seem to become the norm after federal elections in Belgium, the probability that a federal government will eventually be formed is high.	expected that a government will be formed, leading to the disappearance of this risk.	administration as a whole to decide on a particular direction, and it will allow for more leeway for the individual federal organisations.
	Lack of political support, even when there is a federal government	High None of the federal governments have decided to create the function of CIO at the federal level. Therefore, it is expected that this role will not be created.	Examples from abroad, especially in European countries, can demonstrate the usability of a CIO for the federal administration.	
	Lack of willingness within the administration to suggest the role of CIO	High The administration has recently focused on the creation of the G-Cloud, and the federal government recently created the FPS BOSA with the DG DT. It is therefore expected that no CIO position will be created.	Examples from abroad, especially in European countries, can demonstrate the usability of a CIO for the federal administration.	
Re-organise relations between the G-Cloud and the FPS BOSA	Lack of federal government	Low The lack of a federal government risks to lead to a lack of political pressure to develop a vision. Though political crises seem to become the norm after federal elections in Belgium, the probability that a federal government will eventually be formed is high.	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament. It can also be expected that a government will be formed, leading to the disappearance of this risk.	A non-reform of the relation will lead to a situation where the FPS BOSA has difficulties to ensure that other federal organisations follow the suggested Strategy, whereas the G-Cloud would become – as a result of the use of network instruments – a group that commonly decides on steps to follow. Note that this does not mean that the objectives set by the FPS BOSA and the G-Cloud cannot be aligned. Indeed, both

	Lack of political support, even when there is a federal government	High The G-Cloud as well as the FPS BOSA have only recently been created, and political attention for a re-organisation is expected to be very low.	This can only be requested via administrative support for the suggested action, or via an external crisis which requires stronger digital collaboration.	can strive towards the same objectives.
	Lack of willingness within the administration to suggest a re-organised role between the G-Cloud and the FPS BOSA	Moderate The G-Cloud as well as the FPS BOSA have only recently been created, and it can be expected that the administration aims to focus on the use of the current system instead of suggesting a re-organisation in the short-middle long term.	The task of the FPS BOSA to develop a Strategy, in relation to the steering capacity of the G-Cloud, is expected to call for a growing need for collaboration and potential reform of the relation between the two.	
Stimulating (geospatial) data sharing	Lack of willingness to increasingly share data with other federal organisations	Very low Although organisations can have the tendency to protect their organisational interest, it is in the broader federal interest to share information to increase the user-experience.	Sufficient political support as well as continuous attention for information sharing via, among others, the once-only principle can help in increasing the information sharing.	Not taking this action will lead to a continuation of the current approach, where end-users are requested to share information with the public administration that is already known by the public administration. As technology and the legal framework allow for an increased information sharing, the non-implementation of this enabler will result in a decrease of the user-satisfaction.
Updating the geospatial organisational structures	Lack of federal government	Low The lack of a federal government risks to lead to a lack of political pressure to develop a vision. Though political crises seem to become the norm after federal	Historically, the governments in "daily business" have functioned quite well, supported by alternative majorities in Parliament. It can also be expected that a government will	Not updating the geospatial organisational structure will lead to a situation where the full potential of geospatial information for the federal administration cannot be realised, as a combined exploitation of resources (staff

		elections in Belgium, the probability that a federal government will eventually be formed is high.	be formed, leading to the disappearance of this risk.	expertise and financial possibilities) will be lacking. This will, in turn, affect the development of e-services, and as such also the user-experience.
	Lack of political support, even when there is a federal government	High A restructuring of the administration will need to be suggested by the administration itself, as there are no direct political gains for the political level.	Political support for this enabler can only be achieved via administrative support for the suggested action, or via an external crisis which requires a re-organisation.	
	Lack of willingness within the administration's top-management	High Organisations will have difficulties to give up certain responsibilities, and potentially to accept a reallocation of staff, as this diminishes their overall influence and position within the administration and society.	A number of potential positive initiatives can however already be observed nowadays: <ul style="list-style-type: none"> • the increasing and more efficient use of geospatial information and data; • the intensification of (geospatial) data sharing and the increased re-use of data; • a growing expertise in the organisations, which is beneficial for the entire federal administration, as well as the whole country. 	
	Resistance to change within the organisations	Moderate There is a chance that the staff is insufficiently able to participate in the discussion and debate leading to a new organisation,	If the top-management (of the old and new organisation) ensure that the staff is involved in the transition, this can reduce the resistance.	

		creating a resistance to change.		
Increased Interfederal Coordination				
Development of a Belgian EU-style collaboration	Disagreement between all involved public administrations	Moderate All involved public administrations will need to agree on the development of such an ecosystem. The development of an entire ecosystem in the EU-style is highly unlikely, but the development of working groups and coordination organisations can be expected.	The different public administrations in Belgium realise that an improvement of the collaboration is necessary. Also, all public administrations have experience with the EU-style collaboration. Examples exist already at the Belgian level, and the development of other working groups and coordination organisations can thus be expected.	An uncoordinated growth of working groups and coordination organisations between the different public administrations will intensify the complexity of the coordination; will decrease the user-experience due to long-term negotiation needs; and will require more resources than a coordinated approach.
Install a hierarchical relationship in the Belgian federal state structure	Lack of political support	Very high There are no political signals that a redesign of the Belgian Federal state structure, with a hierarchically higher position for the federal administration, is achievable.	No mitigation factors can be mentioned here, as this is a political decision.	The lack of a hierarchical relationship in the Federal state structure creates higher coordination costs and a decrease of the overall user-experience for end-users.
	Lack of modification of the Constitution			
	Lack of moral agreement from the regions			
Culture, ethics and behaviour				
Developing a federal vision	Lack of federal government	Low The lack of a federal government risks to lead to a lack of political pressure to develop a vision. Though political crises seem to become the norm after federal	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament. It can also be expected that a government will	The lack of a federal vision for geospatial e-services will lead to a continuation of the current approach and various organisations will continue to offer e-services to the end-users without necessarily coordinating their activities.

		elections in Belgium, the probability that a federal government will eventually be formed is high.	be formed, leading to the disappearance of this risk.	It is not expected that this would lead to a decline in the service delivery towards the end-users, but however this will not either lead to an improvement for the end-users. Also, within the administration, the absence of a federal vision will lead to increased costs and a duplication of efforts. At the same time, it needs to be underlined that the lack of federal vision on geospatial e-services will continue to allow more freedom to the individual organisations, at the expense of the user-experience and the overall service cost.
	Lack of political support, even when there is a federal government	Moderate Given the high amount of existing needs, there is a risk that the administration needs to focus on other topics than (geospatial) e-services. However, various political actors have underlined the importance of digitalisation.	The top-management of federal organisations can continuously strive to gain attention from the political level for the topic, and pro-actively present the development of a federal vision to the political level.	
	Lack of administrative willingness to agree on a common vision	Low Administrations might agree on the importance of digitalisation, but not necessarily on the specific priorities. Also, administrations are guided by different Ministers (political guidance) and have different thematic priorities. Nevertheless, there is a willingness to collaborate.	The current organisational structures, and use of coordination instruments, already allow the federal administration to develop a federal vision. A further strengthening of the coordination via the suggested "Organisational Structures" enablers will further intensify the possibilities for the development of such a vision.	
Develop an inclusive organisational vision development process	Lack of sufficient expertise to organise an inclusive development process	High The inclusion of staff in the development process requires expertise as well as willingness to include staff.	Attracting, within the organisation, expertise from the academic sector as well as the private sector could mitigate this risk. Also, a structured and centralised knowledge sharing lead via Fedweb can stimulate the	Not developing a process on how to involve staff in the development (or re-development) of new (or existing) services and service processes will lead to a lack of ownership by staff and a lack of expertise to feed the development (or

			expertise knowledge sharing.	re-development) process.
	Resistance to change	Low The lack of sufficient expertise or preparedness to include staff might lead to a lack of willingness from staff to participate in the process. This can also result from previously failed (or perceived as failed) inclusion exercises.	An openly shown willingness and preparedness from the management to include the staff in the development of the development process can already take away part of the resistance to change. Also, consequences of activities need to be clear for staff, which implies that correct information needs to be shared with them.	
Digital culture development plan	Lack of interest and/or attention from top-management	Low Top-management might prefer to focus on the externally visible aspect of redesigning service delivery, thereby lacking sufficient attention for a digitally skilled staff and digital culture.	Federal organisations with a horizontal policy responsibility towards the entire federal administrations can underline the importance of the internal organisational culture in other federal organisations.	The lack of a culture development plan will lead to an uncoordinated approach by the organisations of the digital needs that exist within the organisation. An uncoordinated approach will, in the best case, lead to various initiatives taken by different teams and/or departments, which risk to potentially undermine each other and risk to duplicate each other.
	Insufficient financial capacity	Moderate Depending on the required actions to be taken, which depend on the actions taken in the past, the cost of a digital culture development plan can be high.	Coordination with other federal organisations, as well as support and re-use of existing material and tools, can help to reduce the financial costs. Also, taking into account the financial possibilities from the start can help to reduce negative outcomes based on lack of financial resources.	
	Resistance to change	Low Staff might not be willing to participate in a culture	An openly shown willingness and preparedness from the management to include the staff in	

		development plan if they are insufficiently included in the development process.	the development process can already take away part of the resistance to change. Also, consequences of activities need to be clear for staff, which implies that correct information needs to be shared with them.	
Understanding the public values' balance	Diverging public values' balances	Moderate Different teams, departments and/or organisations that collaborate can have different public values influencing their work, objectives and potentially also their possibilities to collaborate.	Debates and conversations are approaches to deal with differences in the public values' balance.	Lacking an understanding of the public values' balance will lead to situations where different teams, departments and/or organisations are potentially not aligned, thereby leading to sub-optimal outcomes that risk to hamper the service delivery towards the end-user.
	Lack of conceptual knowledge	Low The Toolbox offers a specific section on public values to ensure that the concept is understood.	It is advised to read and apply the information from the Toolbox. Material in this Toolbox can also function as a starting point for more in depth knowledge on the topic of public values.	
Infrastructure				
Development of an ICT architecture	Internal Digital Divide	Moderate Every public servant does not have the skills to operate on such ICT infrastructure.	Trainings can be organised in the administrations to decrease this resistance. If the public organisations have enough budget/time to organise trainings, the enabler can be implemented with the risk mitigated.	<ul style="list-style-type: none">○ If the administration fails to develop an ICT architecture, public servants might be reluctant to rethink the functioning of their ICT infrastructure and its alignment with the ones of other administrations.○ If the administration fails to develop an ICT architecture, some categories of the population (for instance elderly
	External Digital Divide	Low	Creation of "One-stop shops" / "Citizen spots", which are	

		There is a growing concern to include all citizens and to have a “multi-modal” approach.	physical places where citizens with limited (or no) digital skills can benefit from the help of civil servants in order to perform the necessary online formalities.	people or people with disabilities) will be unable to access some public services that are only provided online and require a minimum level of technological capabilities.
	Lack of Federal Government	Very low Though political crises seem to become the norm after Federal elections in Belgium, the probability that a Federal government will eventually be formed is high.	Historically, the governments in “daily business” have functioned quite well, supported by alternative majorities in Parliament.	<ul style="list-style-type: none"> ○ If the administration fails to develop an ICT architecture, the harmonisation of this architecture with the one of other administrations might be more difficult to align politically.
People, skills and competences				
<i>Digital Divide</i>				
Tackling the digital divide	Lack of consideration for the citizens having limited (or no) digital skills	Low There is a growing concern to include all citizens and to have a “multi-modal” approach).	Creation of “One-stop shops” / “Citizen spots”, which are physical places where citizens with limited (or no) digital skills can benefit from the help of civil servants in order to perform the necessary online formalities.	If the public sector fails to tackle the digital divide, some categories of the population (for instance elderly people or people with disabilities) will be unable to access some public services that are only provided online and require a minimum level of technological capabilities.
<i>Public-sector attractiveness</i>				
More recruitment flexibility	Lack of loosening of the legislation regarding the recruitment of civil servants	Very high As these legislations have been set in place in order to avoid discriminations, it is very unlikely that they will be loosened, as adding more flexibility could also potentially	<ul style="list-style-type: none"> ○ Creation of legal structures who have more flexibility in terms of recruitment and who can make more competitive offers to candidates, but who work exclusively for public sector organisations (ex: 	If the public sector fails to adapt its recruitment procedures or fails to create the legal structures mentioned in the previous column, it will continue to struggle to attract the IT profiles it needs as the private sector will continue to make more competitive offers to

		entail more risk of discrimination and biased recruitment.	SMALS). o Recruitment is less of an issue for young people who just finished their studies. For them, the public sector is actually quite competitive, as the salary for a starter is quite good, as there is a good work-family balance, and as they directly have the full amount of legal holidays.	candidates.
More communication about innovative projects	Resistance to change	Low More and more efforts are made to improve the image of the public sector, such as the FPS Finances' collaboration with the newspaper "Metro".	Despite the stereotypical image, some people will always be inclined to work in the public sector for a variety of motives, which can be of a rational (commitment to a public program because of personal identification), norm-based (desire to serve the public interest) or affective (patriotism or benevolence) nature.	If the public sector fails to communicate more about its innovative projects, it will not manage to "wash-off" the negative stereotypes. This, in turn, will make it more difficult to attract the IT profiles it needs.
Convincing management to modernise their departments	Resistance to change	Moderate There is an increased reliance on "Results based management" and an increased availability of "Home-working" possibilities but these are not flexible enough and the hierarchical nature of public administrations is still strong (e.g. possibility to work from home one day a week but	In practice, some modernisation efforts are conducted in specific administrations. For instance, at the FPS Retirement, the teams have to manage themselves. They decide who the team-leader is, depending on the project. This seems to work, as people are much more involved in the project. This creates more	If administrations fail to modernise their ways of working, the negative stereotypical image from which the public sector suffers will continue to be relayed in the society. As a consequence, this will hamper the public sector's attractiveness and its ability to recruit the specific profiles it needs.

		it always has to be the same day of the week).	discussion and implication in the project.	
Focus on continuous training and re-orientation	Disregard for the civil servant's improvement and "career path"	Very low Numerous trainings are organised by the FPS BOSA, and many of the other administrations support internal and external continuous training.	Some ideas of re-orientation initiatives are currently maturing. For instance, the idea of creating an "Internal IT Academy" has been evoked during the focus groups, in order to reorient civil servants into IT programmers ("Java Developer" for example). This could be done with people who want to change their career.	<ul style="list-style-type: none"> ○ As the tasks and missions of civil servants are evolving, and as technology plays a growing part in their daily work, failing to continuously train these civil servants might lead to difficulties in rolling-out projects, if the civil servants have not been taught the competences they need. ○ As the digitalisation is entailing the automatisisation of some tasks and the disappearance of some specific jobs, failing to re-orient the people who are now performing these jobs will make it extremely complex to relocate these civil servants.
Location-based data				
Invest in authoritative data	Lack of legal framework	High The current legal framework only provides a partial basis for the development and use of authoritative data sources: it is only partially in place for the internal federal use of authoritative sources, it does not make a connection to the regional public administrations and it does not provide any connection for a collaboration	Although part of the legal framework dates already from 2014, the federal public administration and cabinet did not invest in the required royal decrees. Currently the public administration has published a list of non-legally binding authoritative data sources, which opens the possibility to consider the non-legally binding list as a mitigation factor.	<ul style="list-style-type: none"> ○ The public administration, both within the federal level and in relation to the other public administration will continue to struggle with its data and the offering of services based on this data. ○ The relevance of certain public administration organisations will be further undermined if no attention is devoted to the relation with the non-public sector on the topic of authoritative data.

		with non-public sector organisations.		
	Lack of agreements with non-public sector on the role of authoritative data	Moderate Currently there is no legal framework that establishes the potential relation between non-public sector data and public sector data. It could however be set-up, although there might be resistance from both sides.	It is advisable that legal frameworks are developed, taking into account the needs of both the public sector and the non-public sector – especially relevant in this regard are ongoing actions of the European Commission concerning data sharing between the public and non-public sector.	The relevance of certain public administration organisations will be further undermined if no attention is devoted to the relation with the non-public sector on the topic of authoritative data.
Use the increased heterogeneity to collect data	Inappropriate legal framework	Moderate The current legal framework is focused on the traditional approaches to use data collected via non-public sector organisations (e.g. buying the data). It is advisable that other approaches are developed and stimulated, such as a reversed PSI or Public-Private Collaboration structures.	An active rethinking with practical examples and suggested collaborations might lead to a decrease of this risk. It is necessary to gain sufficient attention for this topic to ensure that adequate action is taken at the EU level.	Not making use of data collected via non-public sector initiatives will make it increasingly difficult for public sector organisations to ensure their relevance from a data perspective. It will potentially lead to a lack of sufficient data quality and an inability of the public sector to respond to the data requirements of the broader society.
<i>Invest in cross-cutting issues</i>				
Organisational coordination	See enabler 3 Organisational Structures			
Present cross-cutting issues	See enabler 3 Organisational Structures			
Develop appropriate governance structures	See enabler 3 Organisational Structures			

Invest in cross-domain protocols and standards	Lack of resources to participate in international standardisation communities	Moderate Given the limited resources of various federal public organisations, it is likely that the federal organisations can insufficiently participate in those communities.	A potential approach is to divide the participation in those communities among the different federal public organisations, whereby the message of the speaker in the community is priorly agreed upon by the different federal partners.	A lack of standardisation will lead to a stabilisation or decrease in the quality of the services delivered by the federal public administrations.
	Resistance to the implementation of international standards	Moderate Given the limited resources, and the potential lack of participation and influence in the standard-setting process, it is likely that the federal public organisations show resistance to implement those standards.	A commonly agreed approach, and a representation system which ensures participation of the different federal public organisations can mitigate this risk.	A lack of standardisation will lead to a stabilisation or decrease in the quality of the services delivered by the federal public administration.
<i>Increase transparency of location</i>				
Develop guiding data portals	Lack of willingness to include extra relevant metadata by the data providers.	High The difficulties encountered (and still encountered) with INSPIRE risk to lead to a lack of willingness to include extra, useful, metadata in the data portals.	A clear communication towards the federal data providers on why the extra metadata is necessary might decrease the risk. Also, extra support on the collection of this metadata by the organisation hosting the data portal could be useful.	It will continue to be difficult for federal public administrations organisations that do not have location-based data at their core to see what the added value is of location-based data and how they can optimally use it in their service delivery process.
Create a knowledge repository	Insufficient resources to develop a knowledge repository.	Moderate Developing an optimal knowledge repository requires not only a high amount of easy-to-use information, but also a well developed website that	Collaboration between the different higher Belgian public administrations can be useful, as it ensures that the resource costs are shared among the different partners.	There is no direct consequence, but it will remain difficult for non-experts to find relevant information, implying higher research costs and, in the middle- and long-term, also a decrease or stagnation of the overall service quality.

		allows for an efficient search. Those aspects therefore require sufficient resources and constant improvements.		
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Source: Personal research

12. CONCLUSION AND NEXT STEPS

This Work Package (WP 4) dealt with the identification of enablers, which are factors that, individually and collectively, influence whether the requirements for e-service delivery identified in WP 3 can be achieved. This WP is the result of an ongoing research that started at the beginning of the FLEXPUB research project in 2016. The seven COBIT enablers are used as a means to assess the impacts of the changing requirements for the implementation of future public e-services. The results of WP 2 Baseline Measurement and WP 3 Requirements have strongly influenced the direction of this WP 4. On the basis of the needs and requirements collected from the respondents, the research team created an overview of potential enablers that can support the (federal) public administration in finding a way to deal with their needs and requirements.

This holistic set of COBIT enablers is generic and useful for organisations of all sizes, and includes the following enablers:

- Principles, policies and frameworks;
- Processes;
- Organisational structures;
- Culture, ethics and behaviour;
- Information;
- Infrastructure (with associated architectures and standards); and
- People, skills and competencies.

Also, the enabler Location-based data has been studied.

A specific chapter has been devoted to each of those enablers, where the researchers have aimed to find possible approaches to deal with the identified needs and requirements. It has to be underlined that since the research is organised independently for each of the seven enablers, there is only a minor overarching research approach for this WP. The research for each of the enablers is based on in-depth interviews, a general questionnaire, a citizen questionnaire, focus groups, an international practice comparison, a literature review of (scientific) documents, a documents' analysis, or on a combination of those research methods. All those different approaches have contributed to the identification of good practices and possible solutions and/or contributions to deal with the identified needs and requirements.

Besides identifying good practices, solutions and contributions, this WP also devoted attention to the various risks that could prevent the implementation of the suggested enablers. For each of these enablers, a number of risks have been defined and discussed, as well as the likelihood of occurrence of those risks. Risk mitigation factors have been proposed in order to suggest actions to circumvent the risks, or circumstances that reduce the risks' impact. Additionally, the consequences of the lack of implementation of the enablers were outlined in an impact assessment. In this way, the reader can immediately see what the effect of an enabler might be.

Moreover, a number of cross-cutting policy options were included, and a connection has been made to the Digital Belgium approach (2015-2020) which was launched under the impulse of Minister De Croo, and the Sustainable Development Goals (2015-2030) of the United Nations.

Finally, we, as researchers, would like to underline that this Report has been written with the intention to improve the service delivery towards the end-users, to increase the internal collaboration in the federal administration and in respect to the other Belgian public administrations, and to improve the working environment of the Belgian federal staff. Good practices, possible solutions and/or contributions have been listed, and it is now up to the federal administration to decide to what extent the suggested measures should/will be implemented.

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